

Toronto Tomorrow

A new approach for
inclusive growth

SIDE | WALK | LABS



The Plans

Land Acknowledgement

Sidewalk Labs recognizes that this land we now call Toronto has been the site of human activity for over 15,000 years; we are within the Treaty Lands and claimed Territory of the Mississaugas of the Credit. Toronto is now home to many diverse First Nations, Inuit, and Métis peoples. It is the responsibility of all people to share in wise stewardship and peaceful care of the land and its resources. We are mindful of a history of broken treaties, and of the urgent need to work continuously towards reconciliation, and we are grateful for the opportunity to live and work on this land.

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Volume 1

Intro -duction

A Vision for Unlocking the Eastern Waterfront

Sidewalk Labs proposes a vision — beginning with Quayside — designed to realize and maximize ambitious quality-of-life goals by integrating innovations into the physical development.



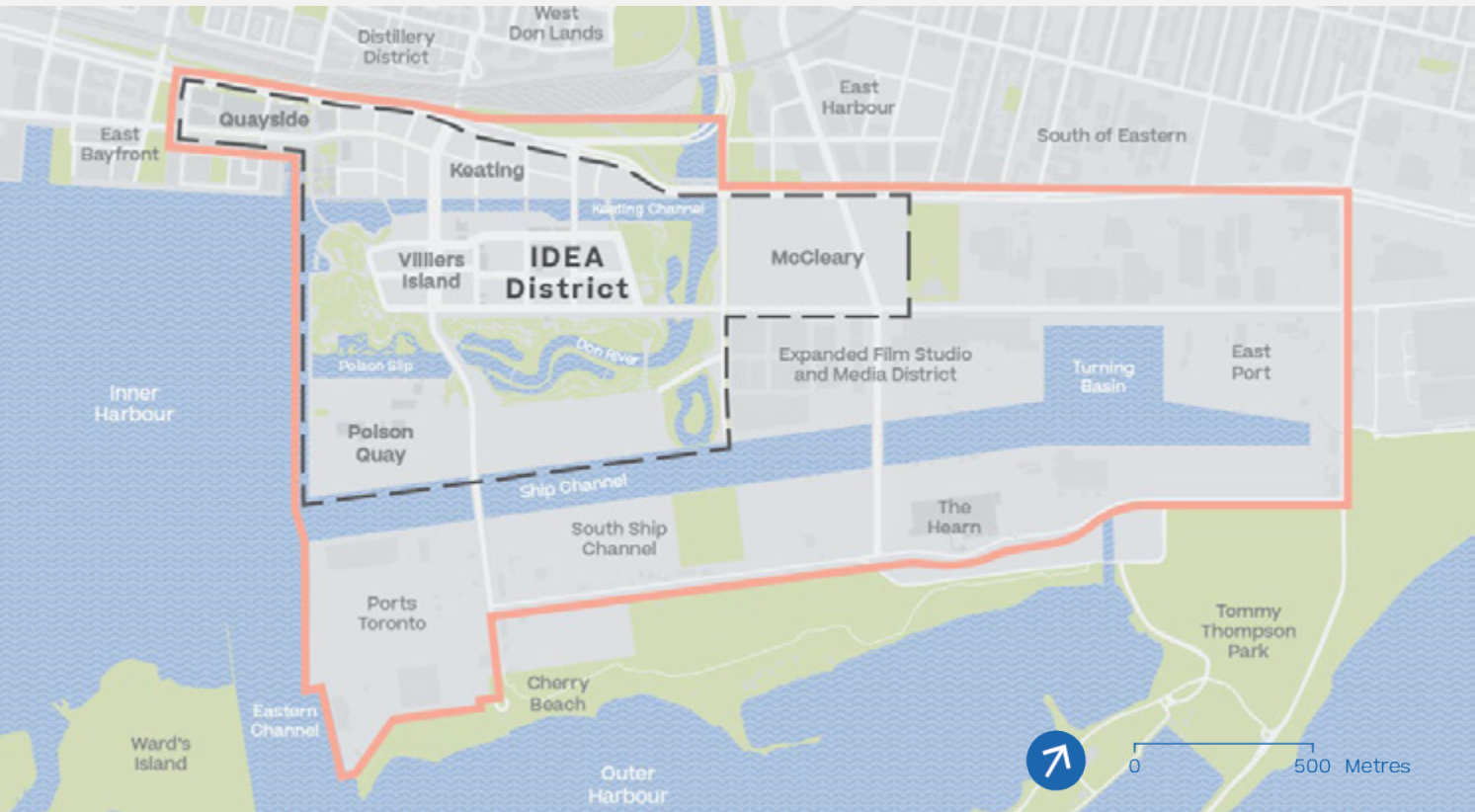
For more details on the project background, see the Overview volume.

The Master Innovation and Development Plan (MIDP) is a comprehensive proposal for inclusive growth along Toronto’s eastern waterfront, informed by more than 18 months of public consultation, following the selection of Sidewalk Labs as Innovation and Funding Partner in October 2017 by Waterfront Toronto, the public corporation formed to unlock the social and economic potential of the waterfront.

In creating the MIDP, Sidewalk Labs has tried to respond directly to Waterfront Toronto’s priority outcomes: job creation and economic development, sustainability and climate-positive development,

housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).

Throughout its planning process, Sidewalk Labs has also tried to respond to Toronto’s Official Plan, which embraces the use of “innovative implementation solutions” to help address tough urban challenges and describes the future city as one where “the private sector marshals its resources to help implement public objectives.” Specifically, the Official Plan calls for leaders in the private sector “with the courage to take risks, develop proactive solutions and then follow through.”



Map
The proposed IDEA District geography

The proposed 77-hectare IDEA District provides sufficient scale to achieve ambitious quality-of-life outcomes.

— Eastern waterfront
— IDEA District

Consistent with these priorities and values, the plans and ideas described in Volume 1 put forward innovative implementation solutions, aim to leverage private resources to realize public objectives, and advocate for sustainable communities along the eastern waterfront.

Creating an IDEA District within the eastern waterfront.

The eastern waterfront is located just east of downtown Toronto, extending around the inner harbour and encompassing the industrial areas surrounding Parliament Slip, the mouth of the Don River, the Ship Channel, and the Turning Basin. As defined by Waterfront Toronto’s 2017 Request for Proposals (RFP), the eastern waterfront is made up of the areas of Quayside, the Keating Channel precinct

plan, and the Port Lands Planning Framework. Some of the area has recently been developed, some is under construction, some supports active industry today, and other lands are underutilized. The total area is over 300 hectares.

To achieve its goals, the MIDP proposes to transform a small portion of the eastern waterfront — less than one-third, to be developed over 20 years — into an Innovative Design and Economic Acceleration (IDEA) District that represents an innovative new development model for how the private sector can support the public sector in tackling the toughest growth challenges.

Exploring phases and roles to maximize impact

From the 2017 RFP to the Sidewalk Toronto Plan Development Agreement, Waterfront Toronto has sought to maximize the impact of its objectives.

The RFP recognized the potential constraint of Quayside, at just five hectares, including a requirement to “describe your team’s ability and readiness to take the concepts and solutions deployed on Quayside to scale in future phases of waterfront revitalization.” The Plan Development Agreement describes the MIDP as including both plans for the Quayside parcel and “plans at scale.”

Consistent with these calls, Sidewalk Labs believes in a phased approach for testing, refining, and demonstrating the impact of core innovations, beginning with a smaller setting and working up to larger areas along the eastern waterfront as project objectives are achieved. Certain solutions cannot reach their full impact at the size of a small neighbourhood like Quayside while others do not become financially feasible at this smaller scale.

For these reasons, Sidewalk Labs has proposed a geography for the IDEA District that can meet or exceed the ambitious priority outcomes outlined by Waterfront Toronto, and do so in a way that is both financially achievable and replicable in other parts of Canada and around the world.

The IDEA District proposal is broken into two phases.

Phase 1: Quayside.

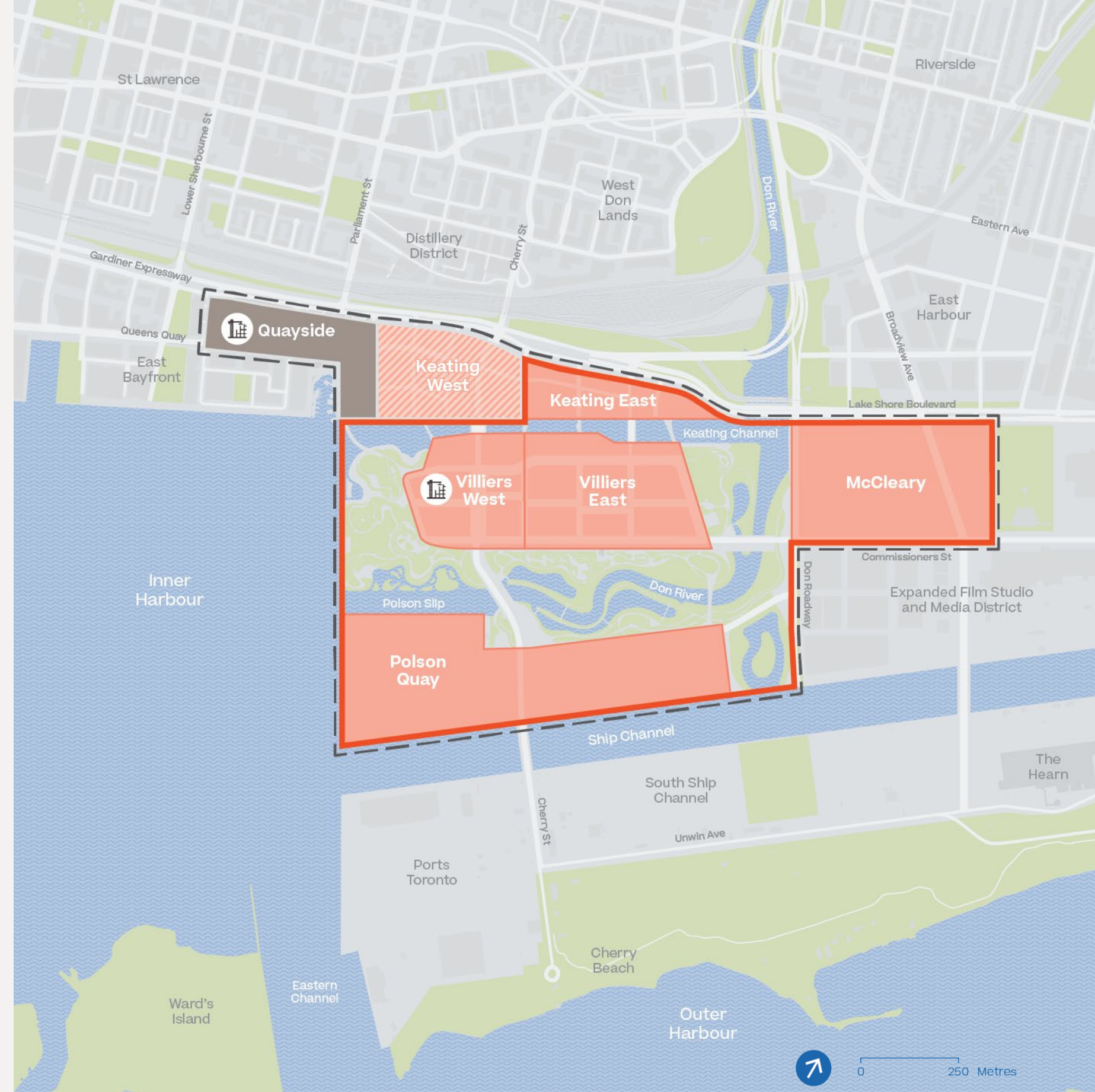
The first phase of the IDEA District would be Quayside, a five-hectare neighbourhood that sits at the crucial transition point to the broader eastern waterfront. The Quayside development plan provides the opportunity to lay out the foundations for achieving the priority outcomes, forming the basis for identifying the required innovations and the critical and advanced infrastructure to make it all happen.

Sidewalk Labs proposes to lead this development, working with local partners, and take the risk of proving the market viability of a proposed development model that incorporates urban innovations to achieve ambitious quality-of-life objectives.

The Quayside phase is explored in the greatest amount of planning detail throughout the MIDP. The “Quayside Plan” chapter begins on Page 24.

Phase 2: River District.

The second phase would be the River District, a 62-hectare area made up of five neighbourhoods surrounding the renaturalized Don River: Keating East, Villiers West, Villiers East, Polson Quay, and McCleary. Extending Quayside’s innovations into the River District would unlock opportunities for Waterfront Toronto and the city to fully realize priority outcomes.



Map Proposed IDEA District neighbourhoods and roles

- IDEA District
- River District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2
- Sidewalk Labs develops real estate and advanced systems

The IDEA District can exceed Waterfront Toronto’s ambitious priority outcomes — and do so in a way that is both financially achievable and replicable in other parts of Canada.

(A Keating West parcel of roughly eight hectares that sits between Quayside and Keating East already has approved plans; the private landowners there can choose to participate in the IDEA District if they want.)

The “River District” chapter includes considerable planning details for Villiers West, a parcel of nearly eight hectares, where Sidewalk Labs proposes to be lead developer, working with local partners. Villiers West would serve as a catalyst for a new economic cluster focused on urban innovation, anchored by a new Google

Canadian headquarters and a new Urban Innovation Institute, and it could further prove out the innovations necessary to achieve Waterfront Toronto’s priority outcomes.

In total, Sidewalk Labs proposes leading development (with local partners) on less than 7 percent of the eastern waterfront.

The “River District” chapter includes only concepts for the other proposed neighbourhoods. It also describes how each core innovation creates greater benefits or becomes economically viable at scale. This chapter begins on Page 254.



See Volume 3 for more details on Sidewalk Labs’ proposed roles for the IDEA District.

Proposed project roles beyond Quayside and Villiers West

Planning and development for the River District would be led by Waterfront Toronto and the City of Toronto, working with various development partners. It is Waterfront Toronto’s mandate to lead the urban planning, design, infrastructure delivery, and real estate development associated with broader geographies along the eastern waterfront.

Sidewalk Labs proposes that government designate a public entity to serve — or in the case of Waterfront Toronto, continue to serve — as revitalization lead for the IDEA District.

Beyond Quayside and Villiers West, Sidewalk Labs proposes to play a different role across the IDEA District, focusing on three supportive areas:

→ Planning, design, and implementation. In this role, Sidewalk Labs proposes to support Waterfront Toronto’s ability to provide cutting-edge infrastructure and development that meets agreed-upon guidelines and standards for innovation, with the goal of realizing key quality-of-life objectives around economic opportunity, affordability, mobility, and sustainability.

Building on the Quayside innovations, Sidewalk Labs proposes to work with Waterfront Toronto to prepare a set of “Innovative Design Guidelines and Standards” that can be used to ensure that all developments in the IDEA District achieve the desired

outcomes. Waterfront Toronto would be responsible for working with government to approve them and then ensure their implementation as development proceeds.

→ Technology support. In this role, Sidewalk Labs proposes to deploy a limited set of technologies required to achieve key project objectives — defined in Waterfront Toronto’s original RFP as “purposeful solutions” — including a dynamic curb that can adjust throughout the day to accommodate vehicle traffic or pedestrian uses, and a standardized mount system that can help catalyze digital innovation by third parties.

→ Optional infrastructure financing. In this role, Sidewalk Labs proposes to provide optional support financing critical infrastructure, such as upfront debt service, to help ensure that the city and waterfront can invest holistically in systems that unlock the potential for future development.

These supportive roles reflect Sidewalk Labs’ belief that the greatest cities are built from the community up, and that the proposed innovation strategies for achieving public policy goals can only be successful if widely adopted by Toronto’s broader development and innovation communities.

Applying this innovative planning approach across the full proposed IDEA District could spark a global hub for urban innovation along the eastern waterfront. Details on these economic benefits can be found in the “Economic Development” chapter on Page 420.

A planning approach that integrates innovations into the physical environment

The development of the IDEA District provides a rare opportunity to achieve — and exceed — the priority outcomes established by Waterfront Toronto for the MIDP.

These objectives have proven largely elusive for a variety of reasons. They speak to problems that cannot be solved in a single development and require a scale of coordination that is difficult, if not unprecedented. In some cases, the solutions are contrary to market forces. For many of these challenges, the technology simply did not exist to successfully address the issues.

That has the potential to change today. The scale of the IDEA District offers the opportunity to create a truly transformative experience — at the moment when technology has finally advanced enough to make genuine breakthroughs, if applied with the right level of thought and care. But realizing this opportunity for the betterment of people's lives and urban economies requires a new approach to urban planning and a strong focus on quality-of-life objectives.

An innovation vision across key areas.

Sidewalk Labs' approach to planning centres around providing the physical, digital, and policy conditions for innovation on which an array of third parties can build and explore new solutions to urban challenges, with the goal of achieving long-term quality-of-life goals.

To catalyze this approach, Sidewalk Labs identified the building blocks of a neighbourhood — **mobility, public realm, buildings and housing, and sustainability** — and explored how urban innovations within these areas could support a new kind of community and infuse flexibility into the built environment.

Many of these advances, from mobility management systems guiding the streets to building systems optimizing energy use, are made possible by **connectivity and digital innovation**. Sidewalk Labs aims to establish the open foundation for a wide array of third parties to address urban challenges using urban data. To ensure that digital innovation aligns with the public interest, all digital proposals — including those by Sidewalk Labs — would be subject to approval from an **independent entity tasked with overseeing a transparent process for responsible data use**, which would apply in addition to existing Canadian privacy laws.

No community is complete without a cross-cutting layer of **social infrastructure** that could provide residents with programs to support health and well-being, education and work opportunities, civic life, and arts and culture. Sidewalk Labs' approach would integrate physical spaces, trusted delivery partners, and digital complements to enable a healthy and engaged community where everyone can grow, thrive, and belong.

Within each of these areas, the planning team incorporated innovations into the development designs with an eye towards achieving Waterfront Toronto's priority outcomes and improving quality of life for all. This goal is reflected in the vision statements for each of the urban innovation areas:

Mobility.

A transportation system that reduces the need to own a car by providing safe, convenient, connected, and affordable options for every trip.

Public Realm.

A system of streets, parks, plazas, and open spaces that encourages people to spend more time outdoors, together.

Buildings.

Sustainable buildings that can be constructed and adapted far more quickly and support a lively mix of uses.

Housing.

A program with 40 percent below-market units to improve affordability and expand options for all households.


Sustainability.

A new standard of sustainability that creates a blueprint for truly climate-positive communities.

Social Infrastructure.

Health, civic life, learning, and workforce initiatives and facilities that enable people to thrive.

Digital Innovation.

Catalyze digital innovations that help tackle urban challenges and establish a new standard for the responsible collection and use of data in cities. 



For more details on the urban innovations proposed by Sidewalk Labs, see Volume 2.

The Quay-side Plan

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Quayside History: A Working Waterfront

While Quayside was once a bustling manufacturing area, and before that a waterway entry point to a vibrant node of commerce and trade for the Northeastern Indigenous Peoples, the rise of the Gardiner and the fall of industry have left the site underutilized — creating a new opportunity to reimagine it for inclusive growth.¹

Sitting on the Treaty Lands and Territory of the Mississaugas of the Credit and the traditional territory of the Haudenosaunee and Wendat,² along Toronto’s waterfront, the site known today as Quayside consists of two portions of land, roughly equal in size, that form an L-shape around the waters of Parliament Slip when viewed from above.³

Quayside emerged during a century of lakefill that began in the 1850s.⁴ Prior to that point, the original lakefront ended at Front Street.⁵ The expansion of the dockwall shifted the water’s edge farther and farther from the city centre — and fundamentally changed the conditions of the waterfront.

For most of the 20th century, Quayside had all the hallmarks of a working waterfront. It was the site of a fish processing plant, as well as an enormous soybean storage and processing plant thrumming with production. Vessels pulled up

to Parliament Slip to be filled with products bound for the St. Lawrence Seaway across Lake Ontario — and to distant seas and harbours beyond.⁶

As times changed, so did Quayside. The rising hulk of the Gardiner Expressway, begun in 1955, stranded the land from the rest of the city.⁷ The fish processing plant closed. By the 1990s, most of the soybean processing facility had been torn down, leaving only one set of grain elevators, which still stand in silent testimony to the area’s past: the Victory Soya Mills Silos adjacent to Quayside.⁸

In recent years, cities around the world have realized that this type of industrial waterfront site is valuable public space. Toronto has been a leader of this trend, including the very creation of Waterfront Toronto in 2001, which has since applied strong people-first planning to much of the central waterfront.⁹ But Quayside and areas to the east have not yet undergone this transformation, and despite Quayside’s spectacular views and close proximity to downtown, the site’s potential remains untapped.

**Despite Quayside’s
spectacular views
and close proximity
to downtown, the
site’s potential
remains untapped.**

This historic view of Quayside shows construction beginning on the Victory Soya Mills Silos, in August 1944.
Credit: Arthur Beales

FILE No. 12083



Quayside Today: Untapped Potential

Waterfront Toronto recognized that revitalizing Quayside requires a bold development plan that is both evolutionary, in terms of building on existing waterfront initiatives, and revolutionary, in terms of applying new innovations.

Today, Quayside remains a post-industrial piece of land used mostly for parking. It has a few scattered buildings, with no parks, plazas, or public gathering places — and no restaurants, stores, or homes. The only occupied structure is a low, cinderblock former fish-processing plant that Sidewalk Labs has renovated into “307,” its main Toronto office and innovation workshop.¹⁰

For all Quayside’s promise, its revitalization faces some imposing physical barriers.

The site is bisected by Queens Quay East, which turns into Parliament Street as it heads beneath the Gardiner — with four lanes of car traffic and few pedestrian crossings. The eastern end of Quayside sits at the edge of Parliament Slip but is difficult to access and set outside the city’s current existing block structure. Much of the lakefill terrain has been contaminated as a result of the area’s industrial history, and making the site safe for development and public space would require expensive measures to cap or remove this soil. Any development requires deep building foundations that drill down into rock, because the soft fill cannot support structures of any significant scale. Basic infrastructure like water pipes, sewers, and power grids would need to be relocated or upgraded to support any new development.

There are psychological obstacles, too. Although Quayside is tantalizingly close to Downtown Toronto, the Gardiner Expressway and the railroad tracks beside it serve to cut off the waterfront from the rest of the city.¹¹ And while Lake Shore Boulevard, Queens Quay, and Parliament Street all meet on the site, the streetcar veers off half a mile away, creating a sense that the site is out past the end of the line.

To be sure, city and waterfront developments are advancing eastward. The East Bayfront Precinct Plan — one of the first precinct plans to be prepared by Waterfront Toronto at its inception¹² — is being realized, and a series of residential and commercial buildings is taking form and being connected by new public spaces, streetscapes, and a water’s edge promenade. The vision is that vibrant ground-floor uses would begin to extend along Queens Quay and the Martin Goodman Trail, and that a new Queens Quay light rail would connect the Central Waterfront through East Bayfront and into the Port Lands.

Quayside completes the vision of the East Bayfront plan while forming a new entry point and beginning for areas further east. The eastern half of Quayside is governed by the Keating Channel Precinct Plan, which sets out Waterfront Toronto’s visions for great public spaces, a vibrant water’s edge, mixed-use buildings, and extension of the light rail.

As waterfront revitalization approached Quayside, Waterfront Toronto’s 2017 Request for Proposals (RFP) envisioned Quayside as something more than the next step in waterfront progress, calling it a “globally significant transformation opportunity that showcases innovative and sustainable approaches to development.” Instead of Quayside serving as the final step to the success of the Central Waterfront, it can become a beginning — the entrance to a reimagined eastern waterfront with innovation at its core that achieves new levels of affordability, sustainability, economic opportunity, and inclusion.

Located just southeast of downtown Toronto, Quayside is a post-industrial area awaiting revitalization.
Credit: DroneBoy



Quayside Tomorrow: Connecting the City to the Eastern Waterfront

Located at the nexus of many key corridors, Quayside can become an essential new link that draws on the energy of surrounding neighbourhoods and makes the eastern waterfront more accessible to Torontonians.

Quayside sits at the intersection of key corridors that span some of the country’s densest, most diverse neighbourhoods to the north and east, new communities rising along Toronto’s revitalized Central Waterfront to the west, and the future promise of the Port Lands to the south.

Parliament Street and the East End: Diverse, historic neighbourhoods.

Parliament Street is home to the revitalized Distillery District and a diverse network of historic neighbourhoods. The corridor continues north through Regent Park and Cabbagetown and ultimately arrives at St. James Town up at Bloor — the most densely populated neighbourhood in the country, where over 60 percent of the residents were born outside Canada.¹³

The St. Lawrence neighbourhood and ongoing revitalization initiatives in Regent Park and West Don Lands are strong Toronto models for mixed-income neighbourhoods and the integration of social infrastructure that Quayside seeks to build upon.

A number of Indigenous organizations, including Miziwe Biik Aboriginal Employment and Training and Anishnawbe Health Toronto, are leading the development of a new Indigenous Community Hub in the neighbouring West Don Lands. Further to the north, a new Indigenous business district on Dundas Street East is being planned.¹⁴

Across the Don River, a number of East End mixed residential neighbourhoods — including Riverdale, Riverside, and Leslieville — connect to Quayside through existing light rail lines and will soon gain an additional link from the future SmartTrack line.

Quayside can extend the mixed-income character of the communities found in neighbourhoods to the north and east, provide the additional social infrastructure the area needs, and establish new public spaces along the waterfront that connect people with the lake.

Queens Quay: New waterfront communities.

The improved Queens Quay runs through neighbourhoods along the city’s revitalized Central Waterfront and many important projects Waterfront Toronto has undertaken, including significant residential development, extension of the light rail along the renovated Queens Quay corridor, and major new public parks such as Sugar Beach and Sherbourne Common.

Sidewalk Labs plans to build on Waterfront Toronto’s work to extend the pedestrian, cycling, light rail, and public realm enhancements through Quayside, creating a vibrant connection to future waterfront development to the east.

Cherry Street: Future waterfront parks and development.

Cherry Street and a series of pedestrian bridges would provide a connection across Keating Channel to the extraordinary new parks that will encircle Villiers Island as part of Waterfront Toronto’s renaturalization of the Don River and link to future neighbourhoods like Polson Quay.

In short, Quayside can serve as a connection point for city and waterfront, lake and land, past and present. It can emerge as a starting point to address the broader challenges of city life and become a model for how urban communities can meet the needs of new generations.

Quayside and surrounding neighbourhoods



What Makes Quayside Different: Applying Innovations to the Plan

Applying Sidewalk Labs’ planning approach and proposed innovations to Quayside would result in a new type of neighbourhood that enables more affordability, more sustainability, and more opportunity for more people than conventional developments — with exploration built into its bones.

The following pages provide a high-level overview of the various physical, digital, design, and policy innovations proposed as part of the Quayside plan. These innovations have been organized around mobility, public realm, buildings and housing, sustainability, social infrastructure, and digital innovation.

Readers wishing for additional details on how these innovations would be applied in Quayside should turn to the technical plan sections of this chapter, on Page 96. Readers wishing for even greater detail on the innovation concepts, including their potential impact on quality of life at various scales of development, should turn to Volume 2 of the MIDP.



Mobility

A transportation system that reduces the need to own a car by providing safe, convenient, connected, and affordable options for every trip.



- A self-financing light rail extension would connect residents to employment hubs and draw workers and visitors to the waterfront from all over the city.
- A vast network of pedestrian and cycling infrastructure featuring wider sidewalks, wider and heated bike lanes, and accessibility elements would encourage walking and cycling and support people using wheelchairs or other assistive devices.
- New mobility services such as ride-hail, bike-share, electric vehicle car-share, and e-scooters would provide affordable alternatives to private car trips.
- An integrated mobility subscription would enable residents and workers to see all their trip choices in real time and pay in one place — a concept often called “mobility as a service.”
- A neighbourhood freight “logistics hub” connected to an underground package delivery system would dramatically reduce truck traffic on streets and improve convenience.
- To reduce congestion and encourage shared trips, a proposed mobility management system would coordinate all travel modes, traffic signals, and street infrastructure, and apply demand-based pricing to curb and parking spaces.
- Flexible street spaces called “dynamic” curbs would provide passenger loading zones during rush hour that could be used as public spaces in off-peak times.
- Adaptive traffic signals would prioritize pedestrians who need more time to cross a street or transit vehicles running behind schedule.
- A set of “people-first” street types would be designed for different speeds and primary uses: Boulevards and Transitways for public transit and vehicle traffic, Accessways designed for cycling speeds, and Laneways designed for pedestrian speeds.

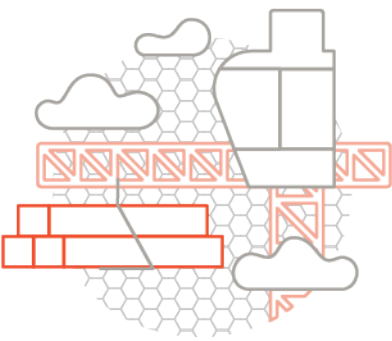


Public Realm

A system of streets, parks, plazas, and open spaces that encourages people to spend more time outdoors, together.

- People-first street designs would eliminate curbside parking, widen sidewalks, and increase tree plantings to improve safety and activate street life.
- Modular pavement — hexagonal pavers that can be replaced or repaired in mere hours by a single person with a handheld machine — would dramatically reduce the amount of time streets spend closed down for road or utility work and increase flexibility of street uses.
- A proposed outdoor-comfort system could dramatically increase the amount of time it is comfortable outside, including Raincoats to block rain, wind, and sun along sidewalks; Fanshells to provide cover in open spaces; and Lanterns to block wind between buildings.
- Flexible ground-floor “stoa” spaces designed to accommodate a wide range of uses beyond traditional retail would ensure that the community has a lively mix of shops, restaurants, cafés, art installations, community gatherings, and maker studios.
- A leasing platform called Seed Space would help small businesses and other retailers book a wide range of stoa sizes, from anchor-tenant spaces to micro-stalls, for short- or long-term uses.
- Quayside’s three primary open spaces would be infused with flexibility to encourage year-round use, including a dynamic water feature and performance space at Parliament Plaza, barges on Parliament Slip, and multi-sport fields in Silo Park.
- A proposed entity called the Open Space Alliance would coordinate programming, operations, and maintenance across Quayside’s parks, plazas, streets, and water spaces for a more responsive public realm.
- Shared programming infrastructure, such as projectors and lighting options, would enable the community to program open spaces themselves.
- A real-time map of public realm assets — from park benches to drinking fountains to landscaped gardens — would enable proactive maintenance and keep spaces in good condition.





Buildings

Sustainable buildings that can be constructed and adapted far more quickly and support a lively mix of uses.

- Quayside would be the first neighbourhood built entirely of “mass timber” — an emerging material every bit as strong and fire-resistant as concrete or steel but far more sustainable — including record-setting buildings of around 30 storeys.
- An Ontario-based factory would produce mass timber building parts for fast assembly in Quayside, catalyzing a new industry that taps into Canada’s vast sustainable forests.
- A digital coordination system called Sidewalk Digital Fabrication would help to coordinate every part of the proposed mass timber supply chain, from the off-site factory to on-site assembly.
- Buildings in Quayside would feature adaptable “Loft” spaces designed with flexible floor plates to accommodate residential, commercial, and light manufacturing uses, enabling a true live-work community.
- A system of flexible wall panels would enable renovations to Loft and residential spaces to occur much faster than normal, reducing vacancies and helping the neighbourhood adapt to market conditions.
- Low-voltage digital power connections — designed to travel over ethernet cables rather than via electrical wires embedded in walls — would dramatically reduce fire risks and facilitate quicker renovations.
- Mist-based sprinklers would provide the same protection as traditional sprinkler systems but use a fraction of the water and facilitate quicker renovations by travelling through narrow tubes instead of being embedded in walls.
- A sustainable material called Shikkui plaster would provide fire protection equivalent to drywall with a fraction of the waste.
- A proposed “outcome-based” building code system would monitor noise, nuisances, and structural integrity in real time to help a mix of residential and non-residential uses thrive without sacrificing public safety or comfort.



Housing

A program with 40% below-market units to improve affordability and expand options for all households.

- Quayside’s proposed mixed-income housing program would feature 20 percent of units as affordable housing (a quarter of which would go towards “deep” affordability needs) and 20 percent of units as middle-income housing.
- Middle-income housing options would include “shared equity” units designed to help households build value in their home without the high up-front cost of a traditional mortgage down payment.
- Half of the total proposed housing program would consist of “purpose-built” rentals that are critical to improving long-term affordability.
- Quayside would feature a set of efficient and ultra-efficient units that reduce size to enable affordability while remaining livable through thoughtful design features, such as space-saving furniture, shared building amenities, and access to off-site storage space with on-demand delivery.
- This approach of “affordability by design” would enable the creation of 87 more units in Quayside than would otherwise exist in a conventional development, creating \$37 million of value that could be applied towards below-market housing.
- A set of co-living units would feature shared building amenities, such as communal kitchens, to enhance community for a range of residents, including single-person households, multi-generational families, and seniors.
- In Quayside, 40 percent of housing would consist of family-sized units at two bedrooms or more.





Sustainability

A new standard of sustainability that creates a blueprint for truly climate-positive communities.

- **Low-energy building designs** — inspired by the Passive House movement — would achieve Toronto Green Standard Tier 3 rating for energy efficiency and Tier 4 for greenhouse gas intensity.
- **A proposed suite of energy “Schedulers”** would optimize energy systems for residents, businesses, and building operators, ensuring that buildings operate in the most efficient way possible.
- **A district energy system called a “thermal grid”** would provide heating, cooling, and domestic hot water without relying on fossil fuels.
- **An advanced power grid** would use solar energy, battery storage, and time-based energy pricing to reduce reliance on the main Toronto Hydro grid during periods of peak demand and make an all-electric community affordable.
- **An innovative bill structure** would enable residents and businesses to set monthly budgets for energy costs, similar to the way people pay for mobile phone plans today.
- **A smart disposal chain** would feature real-time feedback to improve waste sorting and “pay-as-you-throw” chutes to reduce household and business waste.
- **An underground pneumatic tube system** would keep these waste streams separated until they reach a collection facility, reducing contamination and centralizing trash hauling.
- **An active stormwater system** would rely on green infrastructure to capture and retain stormwater and on digital sensors to empty storage containers in advance of a storm.



Social Infrastructure

Health, civic life, learning, and workforce initiatives and facilities that enable people to thrive.

- **A Care Collective** would provide community space dedicated to enhancing health and well-being by co-locating the delivery of health care and community services alongside proactive health programming.
- **A Civic Assembly**, adjacent to the Care Collective, would provide neighbourhood access to spaces for community programs, civic engagement, and cultural events.
- **An elementary school, co-located with a childcare centre**, would ensure that downtown families have access to basic education needs.
- **A proposed collaboration with the Toronto Public Library (TPL)** would explore ways to integrate the library’s presence throughout the neighbourhood, resulting in potential pop-up lending services or TPL-developed classes on digital literacy.
- **An online resource called Collab** could allow community members to decide on public space programming, giving them a nuanced understanding of trade-offs and community impact.
- **The Sidewalk Works jobs program** would bring employers and educators into conversation, prepare workers to acquire in-demand skills, and connect employers with a diverse and talented workforce.

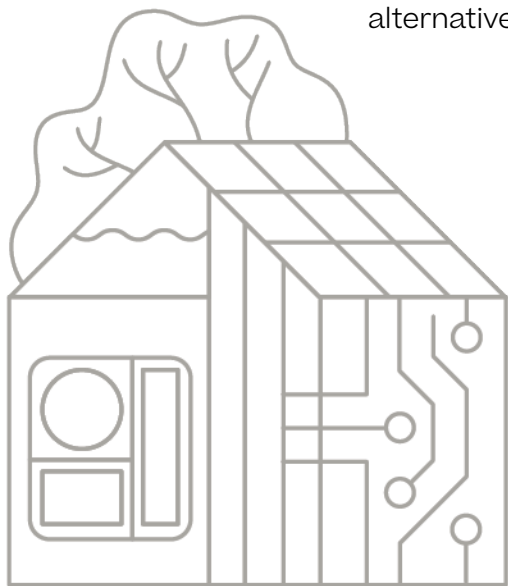




Digital Innovation

Catalyze digital innovations that help tackle urban challenges and establish a new standard for the responsible collection and use of data in cities.

- A ubiquitous connectivity network — powered by a new Super-PON technology that reaches faster speeds with less equipment — can provide households and businesses with a secure personal network across the entire neighbourhood, indoors and outdoors.
- Standardized physical mounts connected to power would dramatically reduce the cost of deploying digital innovations, serving as a sort of “urban USB port.”
- Open, published standards would make properly protected urban data accessible to the community in real time, and make it easy for third parties to build new services or competitive alternatives to existing ones.
- A best-in-class approach to security and resiliency would be designed to prevent disruptions, rapidly detect them, and rapidly restore functionality.
- Building on existing privacy laws, a proposed independent Urban Data Trust would oversee the review and approval of all digital innovations that propose to use or collect urban data in Quayside — whether developed by Sidewalk Labs or third parties.
- The proposed Urban Data Trust would be tasked with establishing clear Responsible Data Use Guidelines that safeguard the public good while enabling innovation, including by making de-identified or non-personal data publicly accessible by default.
- A publicly transparent Responsible Data Use Assessment would ensure that companies or community members wishing to use urban data do so in a way that has a beneficial purpose and protects privacy.

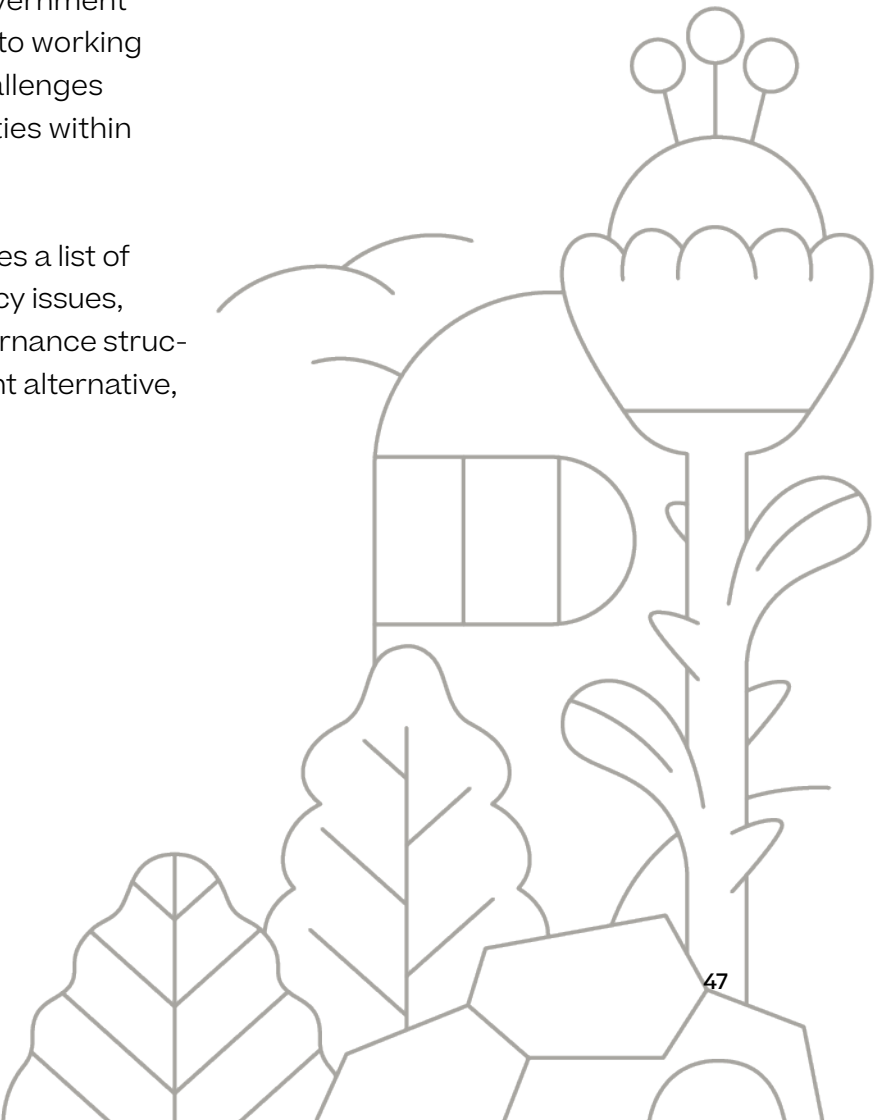


The path to implementing these innovations

Sidewalk Labs recognizes that some of these proposed innovations would require regulatory or policy changes in order to be implemented. Sidewalk Labs also recognizes that these types of changes require significant review and analysis by public agencies at multiple levels and understands how challenging this process can be.

In preparing this proposal, Sidewalk Labs has begun discussions with Waterfront Toronto and government officials and looks forward to working through these complex challenges with the applicable authorities within each order of government.

Volume 3 of the MIDP includes a list of specific regulatory and policy issues, along with a proposed governance structure with which to implement alternative, innovative approaches.



Develop- ment Plan

The Quayside development plan strives to achieve transformative quality of life improvements by combining forward-thinking planning approaches with new physical and digital innovations.

The following pages show the site plan and some illustrative renderings of the neighbourhood, as well as a breakdown of the development program into its core components.

These components include residential uses and a wide range of non-residential uses — including retail, office, production, and community spaces — to create a diverse live-work community.

The Quayside Site Plan

This plan view of the site illustrates the extensive pedestrian pathways in Quayside, as well as a new grand public space at Parliament Plaza.

By creating a new “cove” at Parliament Slip, an exciting new public space oriented around the water, this plan would help connect all Torontonians to the waterfront.

This connection to the water is a major theme of the Quayside plan: residents, workers, and visitors can interact directly with the water through barges, kayaks, and new floating boardwalks.



The Quayside neighbourhood

This view of the Quayside site plan looks northeast towards the Gardiner Expressway. The plan incorporates a series of innovations around transportation, social infrastructure, housing affordability, digital tools, sustainable infrastructure, building construction, and public space

— with the goal of improving quality of life for Torontonians. It reflects 18 months of public engagement needed to refine these planning ideas and start to achieve Waterfront Toronto's ambitious priority outcomes.



Quayside's five sites

The site consists of 2.65 million square feet of developable space, 10 buildings across five sites that mix residential and commercial uses, and four hectares of public realm. At full build, Quayside could house roughly 4,500 residents in a range of housing options affordable to people of all incomes, as well as host roughly 3,900 jobs.¹⁵

Key

Residential

Loft

Commercial

Stoa

Site 1: Building 1

30 Floors (107 m)

Stoa: 60,000 sq ft

Loft: 100,000 sq ft

Residential: 240,000 sq ft

Site 1: Building 2

13 Floors (56 m)

Stoa: 65,000 sq ft

Loft: 165,000 sq ft

Site 2: Building 1

28 & 21 Floors (101 & 78 m)

Stoa: 100,000 sq ft

Commercial: 150,000 sq ft

Residential: 345,000 sq ft

Site 2: Building 2

12 Floors (45 m)

Stoa: 35,000 sq ft

Commercial: 10,000 sq ft

Residential: 200,000 sq ft

Site 3: Building 1

30 Floors (107 m)

Stoa: 45,000 sq ft

Commercial: 100,000 sq ft

Residential: 255,000 sq ft

Site 3: Building 2

10 Floors (44 m)

Stoa: 10,000 sq ft

Loft: 70,000 sq ft

Commercial: 10,000 sq ft

Site 4: Building 1

30 Floors (107 m)

Stoa: 55,000 sq ft

Commercial: 70,000 sq ft

Residential: 265,000 sq ft

Site 5: Building 1

9 Floors (32 m)

Stoa: 10,000 sq ft

Residential: 70,000 sq ft

Site 5: Building 3

4 Floors (18 m)

Stoa: 5,000 sq ft

Loft: 15,000 sq ft

Site 5: Building 2

15 Floors (54 m)

Stoa: 15,000 sq ft

School: 60,000 sq ft

Residential: 125,000 sq ft

Pedestrian walkway: Intimate public spaces

A network of pedestrian-only pathways would be lined with a variety of retail, community, and cultural ground-floor stoa spaces, with housing and offices on upper floors to create a true live-work neighbourhood.

As the world's first all-mass timber neighbourhood, Quayside would become a global model for showcasing this sustainable, beautiful building material.



Queens Quay: People-first streets

A redesigned Queens Quay would create expanded pedestrian spaces that benefit from animated ground floors, curbless streets, lush plantings, and outdoor-comfort strategies that make it possible for people to spend more time outside together.

A new modular pavement system with embedded lights and heating would facilitate safe, welcoming spaces that can adapt to changing conditions.



Parliament Plaza: Connecting land and water

A series of water-based play spaces would anchor a grand central plaza designed to draw people down to the water's edge and host a wide range of activities, from concerts to markets to art installations.

The plaza would be surrounded by two-story ground-floor stoa spaces that host diverse programming and blur the line between indoors and outdoors.



Parliament Slip: Active in all seasons

Framed by lower-scale, intimate buildings, Parliament Slip would offer direct access to the water for activities like kayaking, educational programs, art installations, and relaxation. A new pedestrian bridge would connect the slip with the stunning new parks of Villiers Island.



Outdoor-comfort strategies, such as building Raincoats that extend over the sidewalk and temporary enclosed structures, would support ongoing programming to ensure that the waterfront remains lively and safe year-round.



The Quayside Development Program

Applying these principles and innovations to Quayside would result in a physical development program that is fundamentally more affordable, vibrant, connected, and inclusive than conventional urban developments.

Development in Quayside is governed by zoning bylaws that, if followed exactly, would have a limited impact on some of Toronto’s biggest challenges around affordability and economic opportunity.

In its aspirations to push beyond these bylaws, Waterfront Toronto developed precinct plans and zoning bylaws for Quayside (endorsed by the city) that represent an important departure from typical developments in Toronto, with increased requirements for mixed-use and affordable housing, a focus on creating a top-quality public realm, and an emphasis on sustainability.

Sidewalk Labs embraces this vision and proposes to push these priorities even further, exceeding the targets established in the precinct plans and the zoning bylaws, and creating a new type of development model to achieve the goals established by Waterfront Toronto.

Several aspects of Sidewalk Labs’ vision for Quayside are **evolutionary** in nature, building on progress by Waterfront Toronto and the city.

Quayside’s plans support a significant mix of residential and non-residential space, exceeding the minimum requirements for retail and commercial activity in order to generate street life and drive economic expansion — an approach enabled by flexible building types designed to accommodate a variety of uses and accelerate renovations. Quayside’s plans build in space for community purposes up front, ensuring that residents have

access to schools, health facilities, civic spaces, and arts and cultural programs. And Quayside will advance Waterfront Toronto’s sustainability ambitions through a series of design and technology initiatives that, altogether, would reduce greenhouse gas emissions by 85 percent from the city’s average.

In addition to these efforts, Sidewalk Labs proposes some initiatives that are more **revolutionary** in terms of their ability to push city and waterfront objectives forward in new ways.

Sidewalk Labs proposes to cap heights at around 30 storeys to create a livable neighbourhood, with all-wood construction to create healthy and sustainable buildings. Instead of providing the minimum amount of affordable housing, Sidewalk Labs proposes to increase the range of housing opportunities, including 40 percent of units at below-market rates. Instead of building a neighbourhood and waiting for public transit to arrive, Sidewalk Labs is prepared to assist with the financing for the extension of the light rail in tandem with building Quayside, which would accelerate development opportunities and make the site dramatically more attractive for commercial activity.

These approaches to the development program run counter to current market trends and forces but are fully consistent with the goals for Quayside, as established by Waterfront Toronto, for an affordable, mixed-use community.

- Evolutionary:**
- Greater mixed-use
 - Expanded social infrastructure
 - Ambitious sustainability plan

- Revolutionary:**
- All-wood construction
 - 40% below-market housing
 - Accelerated light rail expansion

A development program defined by a vibrant mix of uses

A cornerstone of Sidewalk Labs’ proposed development program for Quayside is that it calls for roughly 33 per cent of the site’s allowable floor area to be devoted to non-residential uses,¹⁶ encouraging a mix of office space for companies and startups, ground-floor commercial space for retailers and makers, and social space for schools and community groups, in addition to homes.

For Quayside’s residential spaces, Sidewalk Labs proposes an unprecedented commitment to mixed-income housing. Sidewalk Labs plans to meet and even exceed Waterfront Toronto’s 20 percent requirement for traditional affordable housing¹⁷ (a quarter of which Sidewalk Labs would dedicate to “deep” affordability needs) and add 20 percent more below-market housing for middle-income households.

The benefits of this type of complete live-work community include decreased commute times, greater “all-in” affordability because of lower housing costs and travel options that do not require owning a car, and a heightened sense of social cohesion. Sidewalk Labs estimates that this approach would also result in major economic development, with more than 3,900 jobs eventually located in Quayside (and more than 9,000 new jobs in Ontario overall).

Each aspect of the proposed Quayside development program responds to a challenge facing Toronto today. To help show how this plan would address these challenges while building on existing city and waterfront development trends,

the tables on the following pages compare Quayside’s proposed development program to the zoning bylaws for residential, commercial, ground-floor, community, and public spaces, as well as for parking.

(Additional information on how Sidewalk Labs’ proposed plan meets or exceeds existing precinct plans and zoning bylaws is available in the “Planning Policy Justification Report” section of the MIDP Technical Appendix.)

In total, the proposed Quayside development plan consists of five sites, 10 buildings, and 2.65 million square feet of developable space.¹⁸ For several reasons, Sidewalk Labs has decided not to build up to the maximum square footage allotted by the zoning bylaws.

First, Sidewalk Labs believes Quayside can become the world’s first neighbourhood designed entirely out of sustainable mass timber, demonstrating the vast potential of this important technology. Achieving this goal would catalyze a new Canadian industry around mass timber building components, anchored by the launch of a new Ontario-based factory. An all-wood Quayside would also have significant benefits to the environment, removing the equivalent of 20,000 cars from the road annually.¹⁹

Currently, the practical limit of mass timber is around 30 storeys; beyond that height, structural beams become so large that they interfere with usable interior space.²⁰ As a result, the Quayside development proposes buildings around 30 storeys.

Total development program

	Quayside Approximate square feet	Quayside Program percentages	Zoning bylaws ²¹
Total developable space	2.65 million sq ft	100%	3.17 million sq ft
Residential space	1.78 million sq ft	67% of total program	95% of total program
Condo	800,000	45% of residential	
Market rental	270,000	15% of residential	
Below market	710,000	40% of residential	
Non-residential space	870,000 sq ft	33% of total program	5% of total program
Traditional commercial space	340,000	39% of non-residential	
Loft commercial space 3rd to 12th floors	70,000	8% of non-residential	
Stoa commercial space 1st or 2nd floor	140,000	16% of non-residential	
Stoa retail, food, and beverage 1st or 2nd floor	210,000	24% of non-residential	
Stoa production 1st or 2nd floor	20,000	2% of non-residential	
Stoa social infrastructure 1st or 2nd floor	30,000	3% of non-residential	
Elementary school	60,000	7% of non-residential	

Note: Numbers may not add up due to rounding. All numbers are subject to change based on further consultations and refinement of the plan.

Quayside could be home to more than
3,900
jobs.

Second, the Quayside plan aims to proto-type more flexible interior spaces, both with stoa on the lower two floors, which can accommodate a range of retail, production, and community spaces, and with Loft spaces at the mid-rise sections of buildings, which can accommodate commercial and live-work spaces in what would normally be residential-only build-ings. To provide these flexible spaces, floor-to-ceiling heights would be taller than in a typical development, resulting in fewer overall floors within the same general heights.

Third, Sidewalk Labs aims to create a neighbourhood filled with more open and publicly accessible space than it might otherwise have, often with an intimate feel. The Quayside plan would convert Parliament Street into a new concept for a public plaza, Parliament Plaza, and devote more open space to this area than previous plans to create a significant public destination at this location. Additionally, while the East Bayside precinct plan identified a passageway through Sites 1 and 2, the proposed Quayside plan creates a more generous space that extends through Site 3 to connect directly to Parliament Plaza.

Together, these spaces advance the goals of creating more active street life for residents, visitors, and workers, as well as creating new opportunities for small retailers and other ground-floor uses that benefit from foot traffic. Sidewalk Labs believes these benefits are worth the tradeoff in land area for development.

Another example of building less than bylaws allow occurs on Site 5. Instead of pursuing a single larger structure of approximately 12 storeys, Sidewalk Labs proposes a group of smaller buildings for the site. This approach enables pedestrian passageways and courtyards to bisect the site, extending the public realm from Silo Park to the waterfront. It also allows buildings to descend in height as development moves towards the water, ranging from 15 storeys down to 9 and then only 4 storeys at the water’s edge, consistent with priorities of the city and Waterfront Toronto and creating a more human-scaled experience.

Residential uses: More options for all incomes

While the zoning bylaws for Quayside would allow for a development that is 95 percent residential, Waterfront Toronto’s precinct plans for Quayside recognize that an inclusive community should pro-vide options for households of all incomes while also leaving room for non-residen-tial uses. For that reason, the precinct plans call for 75 percent of developable area to be designated as residential space — with 20 percent of units as affordable housing and 5 percent of units as low-end-of-market housing.²²

Sidewalk Labs agrees that the city’s greatest strength is its diversity and that the most successful neighbourhoods welcome a wide range of people and activities. To push the concepts of the precinct plans further, Sidewalk Labs plans to allocate 67 percent of space in

Residential program

	Quayside Approximate square feet	Quayside Program percentages	Zoning bylaws
Residential space	1.78 million sq ft	67% of total program	95% of total program
Condo	800,000	45% of residential	
Market rental	270,000	15% of residential	
Below market	710,000	40% of residential	

Quayside to housing and ensure that it is accessible to a greater diversity of residents, creating a neighbourhood that reflects a mix of non-residential uses alongside residential ones.

To realize the goal of a mixed-income community, Sidewalk Labs plans for 40 percent of housing units in Quayside to be below-market. Half of these units would be dedicated to traditional affordable housing for households at or below 100 percent Average Market Rent (AMR), as defined by the city.²³ The other half would provide housing options — both rental and shared equity — for middle-income households (defined as 100–150 percent AMR), who currently cannot qualify for affordable housing but also cannot afford to pay market prices.

A key part of this program is that it consists of 50 percent purpose-built rentals, or units created specifically to be rented, which are almost non-existent in new Toronto developments. These rentals — which include units at both market and below-market rates — can provide more

flexibility and easier entry into the market for residents, as well as long-term afford-ability for the city.²⁴

Quayside’s proposed housing program also includes new types of flexible, efficient residential units of all sizes that can appeal to single-person households, seniors, and growing families, as well as co-living options, where residents trade some individual unit space for more generous and social community areas within a building.

But affordable homes are just one aspect of an affordable community. To reduce the cost of living, neighbourhoods should also put jobs and essential daily services in close proximity to homes. For that reason, the plans for Quayside devote 33 percent of developable space to a mix of non-residential uses, including offices, ground-floor retail, production spaces, and social infrastructure.

In total, the Quayside plan calls for roughly 2,600 residential units, including roughly 1,000 below-market units.

Non-residential uses: A lively mix of flexible spaces

To advance the shared goal of creating a truly complete community where people can walk to work and enjoy a lively mix of people and activities, Sidewalk Labs’ development plan proposes over six times the amount of non-residential space required in Quayside through the zoning bylaws.

Bolstering the neighbourhood’s commercial presence would position Toronto to capitalize on the rapid growth of a wide

range of new economy businesses seeking to locate in dynamic urban centres that provide inspiration and convenience in equal measure. As just one major driver of this new economy, Toronto’s tech sector alone is poised to provide thousands of new, high-paying jobs — if the city can supply the right spaces.

An office park will not attract this new generation of companies, nor will traditional downtown office towers. Quayside’s proposed commercial program includes 550,000 square feet of office space, integrated within mixed-use buildings

Non-residential program

	Quayside Approximate square feet	Quayside Program percentages	Zoning bylaws
Non-residential space	870,000 sq ft	33% of total program	5% of total program
Traditional commercial space	340,000	39% of non-residential	
Loft commercial space 3rd to 12th floors	70,000	8% of non-residential	
Stoa commercial space 1st or 2nd floor	140,000	16% of non-residential	
Stoa retail, food, and beverage 1st or 2nd floor	210,000	24% of non-residential	
Stoa production 1st or 2nd floor	20,000	2% of non-residential	
Stoa social infrastructure 1st or 2nd floor	30,000	3% of non-residential	
Elementary school	60,000	7%	

Key Term Loft spaces

(found on upper floors) are designed with flexible floor plates to accommodate a range of residential and non-residential uses.

Key Term Stoa spaces

(found on the lower two floors) are designed to accommodate a wide range of uses beyond traditional retail, helping to activate the street.

rather than isolated in office towers that are only occupied during weekday work hours. Employees would have daily access to the creative activity that is the hallmark of thriving, diverse cities.

New types of commercial space.

Nearly 40 percent of Quayside’s commercial office space would consist of adaptable Loft or stoa spaces. These spaces are designed with flexible floor plates and interior wall systems to enable rapid and low-cost renovations in response to changing economic conditions, as well as to accommodate a range of uses.

Loft spaces would be located on floors 3 through 12 in buildings and could potentially be used for residential purposes, in addition to non-residential uses. (Sidewalk Labs plans to implement minimum targets on its Loft spaces for commercial usage, so they always include a mix of residential and non-residential space.)

Stoa spaces would be located on the ground and second floors of buildings to support retail, commercial, production, and community uses that activate the adjacent public spaces and streets.

The other 60 percent of commercial office space with traditional floor plans would also differ from the norm. In keeping with the preferences of new economy companies, these spaces would provide large horizontal footprints similar to the kind often found in old industrial buildings, which promote interaction and collaboration among employees, rather than the small footprints often found in towers, which separate workers across multiple floors and divorce them from neighbourhood street life.

Stoa: More vibrant lower floors.

Street life is what gives cities their energy and vibrancy, offering pedestrians lively storefronts and cafes, neighbourhood essentials like schools and healthcare centres, and access to everything from art galleries to maker spaces to community rooms. This eclectic mix fuels the character of a neighbourhood.

Unfortunately, today these spaces are at risk. Rising rents and high overhead costs are squeezing out all but the most established businesses, which can afford the capital expense, time, and risks associated with opening a ground-floor space.

In recognition of these challenges, the precinct plans developed by Waterfront Toronto devote 5 percent of total building area to retail and community uses intended to activate key street and park spaces. Sidewalk Labs proposes to push this concept further, devoting 15 percent of the development to retail and other active uses — both on the ground floor and extending into the second floor of buildings — to encourage activation of public spaces and support community needs.

Sidewalk Labs calls its proposed ground-floor space stoa in a nod to the Ancient Greek structures that hosted a broad range of civic functions such as markets and teaching spaces.²⁵ These modern stoa spaces are designed to foster a diverse urban ecosystem of stores, galleries, public markets, restaurants and cafes, light manufacturing or production, and community gathering spaces and services.



Stoa’s flexible nature enables it to accommodate a diverse range of uses, including retail, production, commercial, and social infrastructure.

Stoa program

	Quayside Approximate square feet
Stoa space Lower two floors	400,000 sq ft
Commercial space	140,000
Retail, food, and beverage	210,000
Production	20,000
Social infrastructure	30,000

The inherent flexibility of stoa space enables it to be quickly and inexpensively converted into different uses. Stoa spaces would come in varying sizes and involve leases of varying length, supported by a digital leasing platform that enables straightforward applications and fast approvals. The combined impact of these strategies would create new opportunities for small businesses and reassert the streetscape as the centre of civic life.

This flexible design also encourages the programmatic makeup of stoa in Quay-side to shift over time in response to market trends. At any given time, retail might make up 40 to 80 percent of stoa, commercial spaces 15 to 45 percent, social infrastructure 5 to 10 percent, and production 1 to 5 percent.

Stoa: retail, food, and beverage.

The variety of retail offered in a typical community can be limited by economic factors such as high rents, competition from online merchants, and a desire for long-term leases — often leading to retail spaces being dominated by multi-national chains rather than local businesses. The loss to neighbourhood life is significant. Sidewalk Labs plans to dedicate half of Quayside’s ground-floor space to retail and take steps to ensure a diverse mix of stores of all sizes and ambitions by reducing fit-out costs and designing flexible floor plates into its stoa spaces.

Retail uses in stoa could include traditional retail shops, food and beverage service, marketplaces or bazaars, and essential neighbourhood services. The flexible nature of stoa enables production spaces to coexist alongside sales. For example, a major clothing brand could open a retail space next to an incubator workshop, where local clothing makers could create and sell their own independent labels.

Flexible walls help
reduce renovation
costs by

50%
in stoa spaces.

Stoa’s flexible walls also enable the rapid creation of retail spaces of different sizes, making rental and fit-outs easy and affordable for small merchants. Sidewalk Labs estimates that the costs associated with structural elements of renovation, such as moving walls and electrical wiring, would decline by 50 percent in stoa spaces, compared with traditional spaces. So if it would typically cost a landlord \$40 per square foot to make these structural changes, it would instead only cost \$20 per square foot in stoa.²⁶ Tenants who choose to take full advantage of Sidewalk Labs’ prefabricated components and finishings could reap additional cost savings.

Thanks to these low costs, pop-ups should also become a hallmark of stoa retail, with some 20,000 square feet of space devoted to them across both retail and food and beverage.

Stoa: production.

A typical development is not designed in such a way to include light manufacturing, and zoning and building codes often prohibit production spaces within mixed-use projects. But production-oriented businesses are once again becoming a key part of urban economic growth.

Whether it is a small business that needs fabrication space, or an e-commerce craft-maker that needs studio space in a lively neighbourhood, this type of production work need not be located in a remote warehouse in a far-flung industrial district. Artisans and small businesses embedded within Quayside can create unique products and services that reflect and inform the surrounding community, reinforcing the neighbourhood’s culture of exploration.

Stoa space allows for production to occur throughout, with no specific designations. All stoa space is designed to support light manufacturing, such as fabrication or 3D printing spaces, general maker spaces, and other creative endeavours by providing the wide-open floor plates that production facilities tend to need, as well as proximity to the street so large materials can be easily transported.

For retailers, these spaces might be used for on-site assembly, personalized goods, or commissary kitchens. Production is also very much necessary in today’s commercial offices, as can be seen with any prototyping lab or design studio.

Sidewalk Labs anticipates that approximately 4 percent of Quayside’s ground-floor space would be used by production-related organizations or businesses. While certain production uses are not currently permitted under zoning for a development like Quayside, Sidewalk Labs proposes to use a digital innovation capable of monitoring noise, air quality, and other use-related nuisances in real time, with the goal of enabling a vibrant mix of residential and non-residential spaces to coexist safely. As a result, a wide range of new creative and production activities normally relegated to industrial zones could thrive within an urban centre.

Sidewalk Labs plans to work closely with the city to develop this proposed system, which would be operated, managed, and enforced by the City of Toronto, in full accordance with the standards established by the city.



All proposed digital innovations would require approval from the independent Urban Data Trust, described more in the “Digital Innovation” chapter of Volume 2.

Social infrastructure program

	Quayside Approximate square feet
Social infrastructure	90,000 sq ft
Elementary school	60,000
Stoa social infrastructure	30,000

Social infrastructure: Integrated into neighbourhood planning

Social infrastructure encompasses a wide range of vital services and support for all members of a community. In Quayside, the proposed development program would include approximately 60,000 square feet of building space for an elementary school co-located with a childcare facility.

The program would allocate another approximately 30,000 square feet of its ground-floor space to evolving community use. The plan allocates community space for health care and community service delivery alongside proactive health programming, as well as for participation in civic life and cultural activities and the development of digital skills. The Quayside plan would also provide space for ongoing educational programs, such as pop-up libraries and community mentorships.

Such support systems and neighbourhood resources are necessary to ensure the level of access and opportunity that Sidewalk Labs sees as fundamental to any thriving, inclusive community.

Public realm: A wide variety of spaces for all

Public space is an essential component of any urban environment, and one that helps to define the community. Well-designed and active public parks and other gathering places provide opportunities for social interaction, recreation, and many other forms of civic engagement vital to a neighbourhood’s success.

To ensure that the public realm plays a central role in Quayside, Sidewalk Labs plans to provide more than 40,000 square metres of open space and include an extraordinary range of spaces (see Page 79) that can appeal to different groups — from traditional parks, to reclaimed street space made possible by expanded trip options, to new opportunities for engaging with Toronto’s lakefront.²⁷

The Quayside plan would increase comfortable outdoor hours by 35%

The centrepiece of the public realm plan is the creation of a grand new public space called Parliament Plaza that unlocks new ways to access Lake Ontario at Parliament Slip. To create this space, the Quayside plan proposes to close off a block of Parliament Street to cars, with limited expected impact on network connectivity for drivers. (See Page 143 for more details on street network connectivity and the proposed design for Parliament Plaza.) This design is aligned with Sidewalk Labs’ approach to planning, which prioritizes transit, biking, walking, and cycling and assumes an increasing shift away from private car trips.

Creating a wide variety of spaces is a key strategy towards achieving Sidewalk Labs’ goal of encouraging people to spend more time outdoors, together.

It is also critical in a cold-weather city like Toronto that these spaces remain available and activated as much as possible. A proposed set of outdoor comfort strategies and weather-mitigation structures would increase the number of hours it is comfortable to be outdoors by an estimated 35 percent, as compared to traditional public spaces.

Four major locations would become the anchors of this public realm program:

→ **Parliament Plaza.** This 6,000-square-metre gathering place at the heart of Quayside would be surrounded by stoa space and include dynamic water features and an overhead canopy for weather protection in all seasons.

→ **Parliament Slip.** At this 6,000-square-metre space, residents, workers, and visitors could connect directly with the water via a new “cove” feature (Parliament Cove), as well as a stretch of dedicated parkland running along the slip’s eastern edge.

→ **Queens Quay.** This 7,500-square-metre stretch of public space along the street would represent a major expansion of typical sidewalk space, made possible by narrowing the width of vehicle lanes and creating dynamic curbs that can become public spaces during off-peak times.

→ **Silo Park.** This 5,000-square-metre park across from the Victory Soya Mills silos would serve as the green and recreational heart of the community.

Public realm program

	Quayside Approximate square metres
Public space	40,700 sq m
Parliament Plaza	6,000
Parliament Slip	6,000
Queens Quay	7,500
Silo Park	5,000
Other Sidewalks, buffers, courtyards, and promenades	16,200

Parking:
Dramatically reduced

One component of Quayside’s plan is notable for its near absence on-site: parking. Adhering to zoning bylaws, a traditional development would create on-site parking lots and likely build expensive underground garages to serve approximately 2,400 spaces.²⁸

In Quayside, no parking would be provided above ground and only 500 spaces would exist in a below-ground lot for visitors. Residents and workers who choose to arrive in the neighbourhood by car could pick up or drop off their vehicle at an underground interchange facility in Quay-side, with storage at a 750-space off-site parking facility in the Port Lands or a nearby location.

This reduction in on-site parking is possible because Sidewalk Labs’ mobility plan is designed to provide convenient and affordable alternatives for virtually every trip by expanding public transit, bike networks, pedestrian infrastructure, and ride-hail options. Sidewalk Labs also predicts that, within the next 15 years, shared access to self-driving vehicles would fill any remaining needs that private cars serve today.

By unbundling the parking requirement from the site itself, Quayside’s plan can use neighbourhood space that would normally go towards parking for buildings or the public realm — without reducing mobility.

Parking program

	Quayside Number of spaces	Zoning bylaws
Total parking	1,250 spaces	2,400 spaces
On-site above grade	0	2,400
On-site below grade	500	
Off-site	750	0

Eliminating parking lots would improve the quality of the pedestrian experience on the sites by freeing up potential space for plazas, sidewalks, and other public uses. And eliminating the cost of parking garages enables developers to create more shared spaces in buildings. They can also pursue higher-quality architectural designs, with curves or other interesting shapes, since the layout of a parking garage often determines the structural columns of the building above it. In other words, removing the need for on-site parking enables structures that can respond to the needs of people rather than the requirements of car storage.

Expanded public transit, bike networks, pedestrian walkways, and ride-hail options would dramatically reduce the need for on-site parking — freeing up space for a bigger, more vibrant public realm.

Program spotlight
Parking:
Available,
but not too
convenient

Quayside’s expanded set of mobility options means residents and workers are expected to travel mostly by public transit, walking, biking, or shared rides — driving only infrequently.

For example, modelling suggests that only 8 percent of people who work in Quayside would drive into work; it also suggests that just 30 percent of Quayside households would own cars,²⁹ compared with the 48 percent of downtown households today.³⁰

Infrequently used vehicles are best accommodated by off-site attended parking. Residents or workers could store vehicles off-site at reasonable monthly rates and hail them through apps. Because few Quayside residents are expected to drive to work, most use of the lot would occur during off-peak hours, minimizing the impact on peak traffic.

Underdeveloped sites near Quayside could host these secure parking facilities, which would be equipped with electric vehicle charging facilities and managed by the proposed Waterfront Transportation Management Association. Residents or workers could of course choose to pay higher rates for the on-site parking garage.

(See the "Mobility" chapter of Volume 2 for more details on the Waterfront Transportation Management Association.)

Together, these parking facilities are meant to provide an option for those wishing to drive while encouraging residents and workers to consider alternatives to driving — consistent with the climate-positive and affordability objectives for Quayside.

Committing to Diversity, Equity, and Inclusion

Designing neighbourhoods that everyone can access means planning for the full spectrum of people’s abilities, whether physical, digital, economic, social, or cultural. Sidewalk Labs aims to create the conditions that bring people together, not pull them apart, and that provide new opportunities for all.

Sidewalk Labs has approached its planning for the Sidewalk Toronto project with the following principles in mind:

Diversity. Sidewalk Labs recognizes and honours the vibrant diversity of Toronto, and strives for a place that reflects Toronto’s values around diversity — one where people of all ages, abilities, incomes, and backgrounds can thrive and belong.

Accessibility. Sidewalk Labs prioritizes accessibility of place, transportation, services, and opportunities to ensure Quayside is physically, socially, economically, and culturally accessible for all, including residents, workers, and visitors. Sidewalk Labs designs spaces, systems, and services for 100 percent of the population, including people who face multiple barriers.

Affordability. Sidewalk Labs includes options for housing, retail, programming, and amenities

that are affordable for people of all income levels, including those who are low income.

Equity of opportunity. Sidewalk Labs works to identify and remove systemic barriers to participation so everyone can exercise the right to fair and respectful access to economic, social, and cultural opportunities, paving the way for equitable outcomes.

Inclusion. Designing neighbourhoods that everyone can access means planning for the full spectrum of people’s circumstances: physical, digital, economic, social, or cultural. Quayside would create the conditions that bring people together, not pull them apart. These conditions can help create an inclusive community — a group of people who share a sense of belonging, trust, safety, and collective stewardship in a place where everyone feels welcome and has an opportunity to flourish and thrive.

Sidewalk Labs aims to create the conditions that bring people together.





See the “Buildings and Housing” chapter of Volume 2, for more details on the proposed housing vision.

Affordability by the numbers:
→ **40 percent below-market housing program**
→ **\$4,000 annual savings through mobility subscription package**
→ **Affordable electrification that maintains or reduces utility costs**



See the “Economic Development” chapter of Volume 1, on Page 420, for more details on planning for prosperity with equity.

Honour strength in diversity

Sidewalk Labs recognizes and honours the range of visible and invisible qualities, experiences, and identities that shape who people are, how they think, and how they engage with and are perceived by the world. These include but are not limited to race, ethnicity, gender, marital and family status, sexual orientation, socio-economic status, age, physical or mental abilities, religious or spiritual beliefs, Indigeneity, immigrant and newcomer status, and political ideologies.

Sidewalk Labs deliberately and thoughtfully strives to develop designs, spaces, services, and programming — in partnership with local institutions — that are welcoming, iterative, responsive, and accessible to a diverse population, including people who face multiple barriers.

Design accessibility for people of all ages and abilities

Sidewalk Labs’ commitment to intergenerational communities involves developing a variety of housing types and sizes, pedestrian-friendly streets, and complete communities where people can easily access shops, social services, and community spaces. This commitment is particularly relevant for populations that tend to stay closer to home, including children and seniors.

Sidewalk Labs also plans to establish a host of physical and digital accessibility initiatives co-designed with members of the disability community, including **accessible streets, building entrances, and public washrooms, as well as way-finding tools for people who are visually impaired**. These initiatives would aim to meet or exceed existing Accessibility for

Ontarians with Disabilities Act (AODA) requirements. They are based on 22 general, physical, and digital accessibility principles developed in collaboration with more than 200 members of the accessibility community in Toronto during 70 hours of co-design sessions.

Create affordability for people of all incomes

A mix of incomes, lifestyles, and life-stages is essential to generating a neighbourhood’s sense of community and energy. Sidewalk Labs’ proposed housing program has been designed to set a new standard for inclusive communities.

An ambitious affordability vision would target residents across the income spectrum: **overall, 40 percent of units would be below-market**. This breakdown includes 20 percent of units devoted to traditional affordable housing (at least a quarter of which would go towards households with “deep” affordability needs) and 20 percent of units for middle-income housing.

In contrast to conventional waterfront revitalization in Toronto, often dominated by market-rate condos, a full **50 percent of housing units would be “purpose-built” rentals, improving long-term affordability for the city**. A new set of efficient unit designs would reflect a broader effort to make downtown living affordable and meet the evolving needs of Toronto’s diverse households.

In addition to expanding housing affordability, **Quayside would strive to improve the “all-in” affordability of living in the neighbourhood**. For example, a mobility subscription package would enable households to forgo car ownership, saving more than \$4,000 a year without

sacrificing the ability to get around. A new approach to affordable electrification would maintain or reduce overall utility costs for households and businesses while achieving more sustainable outcomes.

Ensure opportunities for all

Sidewalk Labs believes that a strong plan for economic growth requires an equally strong commitment to inclusion.

Sidewalk Labs plans to take a proactive “community benefits approach,” based on community input, to ensure that equitable economic opportunities are open to a wide range of Torontonians. This effort includes creating training and employment opportunities for members of historically disadvantaged and equity-seeking groups, together with employers, community organizations, training providers, and labour.

Building on the Waterfront Toronto Employment Initiative, Sidewalk Labs plans to work with a range of partners — including Toronto Employment and Social Services, Dixon Hall, Miziwe Biik Aboriginal Employment and Training, and Access Employment, among others — to provide opportunities in both the construction and tech sectors. The project will set minimum targets, including requiring **10 percent of all construction hours to be worked by members of equity-seeking groups**.

While creating meaningful employment in the industries of today is important, so too is helping to cultivate the next wave of local entrepreneurs. Sidewalk Labs envisions a **business incubator program developed with a local partner to provide space and support** for underrepresented and for low-income entrepreneurs, and small business owners from diverse communities.

Planning spotlight

Planning for resiliency to ensure a safe future

Resilience is critical for successful neighbourhoods and has been a core priority for Waterfront Toronto, as demonstrated in part by its Resilience and Innovation Framework. Sidewalk Labs’ resiliency planning addresses climate-related shocks and other stressors designated as critical to Toronto by ResilientTO, such as housing, congestion, and robust social networks. The below list includes examples of how Sidewalk Labs plans to approach resiliency by being proactive, responsive, and informative.

Proactive. Stormwater management systems would be designed to mitigate flooding risk, including robust green infrastructure to capture water, and environmental sensors that free up water storage space in advance of storms. Connected utility infrastructure would enable predictive maintenance to stop major failures before they occur. Redundant physical infrastructure would ensure reliable accessibility before, during, and after a weather event.

Additionally, open-source software would allow Sidewalk Labs to learn about potential problems from the data security community before they happen, and proactive threat-modelling will improve response readiness. Finally, designing to encourage strong social infrastructure and community cohesion would ensure that social networks could be quickly activated in the event of emergencies.

Responsive. Buildings would have backup generators and draw power from Toronto’s main electricity grid, which has 99.99 percent reliability, reducing the likelihood of a power outage. In the event such an outage does occur, high-performance building envelopes would enable thermal resiliency without the use of any backup mechanical heating system.

Informative. Sidewalk Labs would help amplify the city’s emergency preparedness plans and emergency messaging prior to, during, and after any event through additional physical and digital communication methods such as apps and signage.

Supporting robust social infrastructure

Social infrastructure fosters health and well-being, ties together communities, and helps people reach their highest potential.

Proactive planning for social infrastructure — including health, civic engagement, lifelong learning, and arts and culture — is critical to achieving an inclusive community. Quayside should be a place that creates and sustains good health for all by enabling proactive, coordinated, continuous, and holistic approaches to health, care, and well-being. It should foster a civically engaged community underpinned by deep social ties and a strong sense of pride and belonging. And it should provide the conditions to explore, produce, and experience creative expression of all kinds.

Sidewalk Labs plans to take a proactive approach to health and well-being that recognizes the social determinants of health. This approach would be reflected through a built environment designed to promote active transportation and infuse nature into the streetscape. A Care Collective, operated through service-delivery partnerships, would seek to meet the diverse health needs of people in their local neighbourhood.

Quayside would also have a central location for community connection and participation that would be the heart of civic life: the Civic Assembly, a place to connect with neighbours, learn about what is going on in and around the neighbourhood, share ideas, express creativity, engage in cultural activities, and get technical assistance on digital tools.

Committing to Indigenous Communities

Sidewalk Labs will work to reflect and acknowledge traditional and contemporary Indigenous presence in Quayside, and commits to contributing to prosperity and opportunity for local Indigenous communities.

There is a collective responsibility to share in wise stewardship and peaceful care of the land and its resources.

Quayside sits on the treaty lands of the Mississaugas of the Credit First Nation. Today, there is a significant diverse urban Indigenous community in Toronto. Sidewalk Labs acknowledges the urgent need for, and is committed to furthering the goals of, reconciliation with Canada’s Indigenous Peoples.

Quayside is close to a number of Indigenous organizations and districts, including a new Indigenous business district on Dundas Street East, which will include an Indigenous Centre for Innovation and Entrepreneurship, Miziwe Biik Aboriginal Employment and Training, and Anishnawbe Health Toronto, which is developing a new Indigenous Community Hub in the neighbouring West Don Lands.

Over half of the Indigenous people in Canada now reside in urban centres. This project is an opportunity to model how contemporary city building can contribute to, and support, urban Indigenous prosperity and opportunity. Sidewalk Labs will strive to create opportunity for local Indigenous communities through a number of initiatives.

These commitments include:

- Engagement. Sidewalk Labs will engage Indigenous communities, including the Mississaugas of the Credit First Nation, in ongoing dialogue to build a mutually respectful relationship and explore potential collaborations.
- Workforce initiatives. Sidewalk Labs will work with Indigenous workforce agencies (such as the Miziwe Biik Aboriginal Employment and Training and the Centre for Indigenous Innovation and Technology) on both skills training and job opportunities in construction and tech, and include Indigenous suppliers in diverse procurement strategies.
- Design and education. Sidewalk Labs will reflect and acknowledge Indigenous presence on the waterfront. In November, Sidewalk Labs held a design consultation with Indigenous participants, designers, and artists led by Brook McIlroy’s Indigenous Design Studio to imagine (among other things) educational opportunities and Quayside’s future through the lens of Indigenous design.

For the Sidewalk Toronto project to truly contribute to Indigenous prosperity and opportunity, Indigenous voices must be at the table. Sidewalk Labs is committed to ongoing conversations and collaboration with Indigenous communities in Toronto throughout the development process.

Mississaugas of the Credit First Nation. The Mississaugas of the Credit First Nation (MCFN), part of the Ojibwe (Anishinabe) Nation, is one of the largest Aboriginal Nations in North America.

MCFN asserts unextinguished title to all water in its claimed traditional territory including Lake Ontario, and any adjacent lands under water or formerly under water. The land on which Quayside will be built are lands covered by Treaty 13/13A Toronto Purchase (1805) between the Mississaugas and the Crown.

As a company proposing a new vision for these lands, Sidewalk Labs intends to engage with, and include, MCFN in the project.

Sidewalk Labs recognizes the aspirations of the MCFN as articulated in their vision statement: “[MCFN] looks to our Anishinabe roots to guide our vision for the future as a strong, caring, connected community who respects the earth’s gifts and protects the environment for future generations. Our identity includes our history, language, culture, beliefs and traditions which we strive to incorporate into the programs and services offered to our community.”

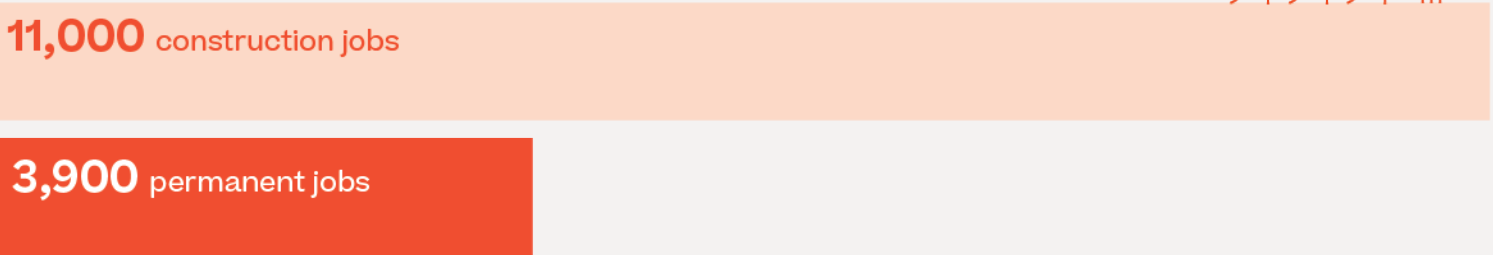
In partnership with Waterfront Toronto, Sidewalk Labs has started an important ongoing dialogue between project staff, MCFN Chief R. Stacey Laforme, and the MCFN Department of Consultation and Accommodation (DOCA). Sidewalk Labs thanks Chief R. Stacey Laforme, MCFN band councillors, and DOCA staff for their generous time during the development of this MIDP, and looks forward to continued meaningful and respectful conversation. It is Sidewalk Labs’ hope that this important engagement improves the environmental, social, cultural, and economic well-being of the city and all the project’s stakeholders, including MCFN.

Quayside Impact: The New Bottom Line

The Quayside development plan lays the foundation for achieving Waterfront Toronto’s priority outcomes: job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).

Economic impact: Creating 11,000 construction jobs and catalyzing a new mass timber industry

Job creation and economic development



Development on the waterfront should support Toronto’s need for continued economic success and growth in employment. The Quayside development plan would catalyze economic growth in the short term and the long term — creating an estimated 11,000 construction jobs in Ontario and hosting nearly 3,900 new permanent jobs in a true live-work community.³¹

The advanced designs and technologies proposed as part of the plan would help grow new Canadian industries, including tall-timber design and construction, modular supply, and new mobility technology.

The plan also incorporates flexible ground-floor spaces called stoa that support small-scale businesses throughout the neighbourhood and mix more non-residential space into buildings. The adaptable ground floor is designed to merge with sidewalks and the public realm, forming civic arcades filled with community space, local pop-ups, light manufacturing, small businesses, or micro-enterprises. Rather than requiring long-term leases that are only possible for select global retailers, this flexible stoa space, combined with new digital tools, would lower the barriers for new businesses to get started.

Climate impact:

A nearly carbon-neutral neighbourhood that cuts GHGs by 85%

Sustainable and climate-positive development



-85% less CO2

Following Waterfront Toronto's lead in sustainable development, Quayside would produce seven times less CO2 than other Toronto neighbourhoods.³² Sidewalk Labs proposes a series of innovations and planning initiatives that would drastically reduce greenhouse gas emissions below the levels in comparable projects:

- **Prioritizing** biking, walking, public transit, and electric vehicles
- **Reducing** truck deliveries on local streets by coordinating freight through a logistics hub
- **Relying** on clean energy, including from building heat recovery systems, geothermal wells, solar capacity, and battery storage

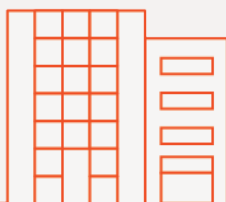
- **Managing** energy consumption more actively and efficiently using digital technology
- **Designing** buildings to reduce energy use by meeting the Toronto Green Standard Tier 3
- **Managing** waste and stormwater more effectively and holistically through a smart waste management system and active stormwater management

Through these initiatives, Quayside would set a new standard of sustainability that builds upon the vision of Waterfront Toronto and all three levels of government, taking the first steps towards a climate-positive community on the waterfront.

Affordability impact:

40% below-market program

Housing affordability



+40% units below-market

The housing program in Quayside is specifically designed to address the housing gridlock facing the city today, providing options and opportunities for more Torontonians on the waterfront.

Meeting the intent of the Central Waterfront Secondary Plan requirement, Sidewalk Labs plans to deliver 20 percent of housing units as affordable housing in Quayside (as defined by the city as being at or below 100 percent Average Market Rent), with at least a quarter of these units going towards households with “deep” affordability needs (as defined as households at 60 percent of AMR).

Recognizing the challenges in the market for middle-income households, the Quayside housing program goes beyond this requirement to include another 20 percent of units for middle-income households (for example,

mid-range rental at 100-150 percent AMR). Together, these units create a 40 percent below-market program to help achieve unprecedented new levels of affordability.

In addition to housing, the Quayside plans would improve all-in affordability by providing an extensive range of transportation options that make it possible for households to get around conveniently without the need to own a car — saving two-person households an estimated 40 percent on annual transportation spending, or roughly \$4,000 per year.³³

Quayside would also provide the proximity to everyday essentials that defines a complete community for people of all ages and abilities, featuring an expanded public realm and access to essential social infrastructure, including spaces dedicated to health, education, civic life, the arts, and culture.

Mobility impact:

73% of trips using transit or active modes, with 91% more pedestrian space

New mobility



73% of trips using public transit, walking, or cycling

Rapid urban growth is making it harder to get around, but support for transit and innovations in mobility management offer opportunities to help people and goods move more easily.

The plans for Quayside would support light rail expansion, provide exceptional bike and pedestrian infrastructure, and encourage on-demand mobility services priced for sharing. Streets would be made safer with digital technologies, including responsive traffic signals that can prioritize pedestrians. Quayside would also pilot a new neighbourhood delivery system that collects all packages in one logistics hub and then distributes them via a below-grade tunnel system, reducing truck traffic on local streets, along with noise and air pollution.

Sidewalk Labs estimates that, taken together, these mobility initiatives would reduce the percentage of trips made by

private automobiles in Quayside from the 27 percent made in comparable neighbourhoods to just 13 percent by 2025.³⁴

Quayside’s expanded mobility options enable the neighbourhood’s streets to reclaim significant amounts of street space for pedestrians. While designed for safe operation today, the streets in Quayside would also be the first in the world designed specifically to anticipate the potential benefits of self-driving technology. Sidewalk Labs estimates that its street designs could provide 91 percent more pedestrian space than a business-as-usual development scenario, thanks to features such as narrower lanes and the potential for self-driving vehicles to share a right-of-way with public transit without hindering transit efficiency.

And when all dynamic curb spaces are open to pedestrians, during very low pick-up and drop-off periods, there would be a 118 percent increase in pedestrian space.

Urban innovation impact:

Catalyzing digital innovation while protecting privacy

At the heart of the vision for urban innovation in Quayside is the ability to create the digital conditions for others to build on. These conditions begin with flexible, affordable digital infrastructure that includes a powerful and affordable ubiquitous connectivity network that leverages new advances to improve speed and security, as well as a standardized mount system that reduces the cost of deploying innovations and eliminates vendor lock-in.

publicly accessible (with the proper protections, including de-identification), further catalyzing third-party creation.

Above all, Sidewalk Labs understands realizing the promise of digital innovation in a responsible manner requires an approach to governance that protects privacy and makes the benefits of urban data widely accessible.

To meaningfully enable responsible data use in Quayside, Sidewalk Labs proposes that urban data be controlled by an independent entity called the Urban Data Trust, charged with balancing the interests of personal privacy, public interest, and innovation. This public steward would establish a clear process for approving any initiative that involved the use or collection or urban data for all parties, including those proposed by Sidewalk Labs.

Sidewalk Labs proposes that the Urban Data Trust anchor this process around a publicly auditable Responsible Data Use (RDU) Assessment — an in-depth review that is triggered by any proposal to collect or use urban data — and guided by a set of RDU Guidelines that incorporates globally recognized Privacy by Design principles.

Key Term

Urban data

Information gathered in the city’s physical environment, including the public realm, publicly accessible spaces, and even some private buildings.

As with ecosystems such as the World Wide Web, third parties depend on open hardware and software as well as on an agreed-upon set of standards and protocols to successfully deploy their ideas. A set of published standards around open-data architecture, access, and sources would enable third parties to build upon a shared foundation, supported by a common set of security, formatting, and communication standards.

To implement the systems needed to achieve quality-of-life objectives, Sidewalk Labs plans to purchase third-party technology or partner with third parties to create (or enhance) it whenever possible, giving priority to technology that is local to Toronto, Ontario, or Canada. For systems that Sidewalk Labs needs to develop itself, because they do not exist in the market, data would be made




For more details on the proposed Urban Data Trust and responsible data use process, see the “Digital Innovation” chapter of Volume 2.

Exploring larger scales to realize and maximize the impact achieved in Quayside

Quayside can take meaningful steps towards realizing Waterfront Toronto's priority outcomes and a new model for urban development. But some of the elements of the Quayside plan are only economically viable or programmatically effective when deployed across a sufficient geographic scale. More importantly, the opportunity to achieve Waterfront Toronto's priority outcomes need comprehensive planning and scale.

The RFP recognized the potential constraint of Quayside, at just five hectares, including a requirement to “describe your team’s ability and readiness to take the concepts and solutions deployed on Quayside to scale in future phases of waterfront revitalization.” The PDA describes the MIDP as including both plans for the Quayside parcel and “plans at scale.”

Consistent with these calls, Sidewalk Labs believes in a phased approach for testing, refining, and demonstrating the impact of core innovations, beginning with a smaller setting and working up to larger areas along the eastern waterfront as project objectives are achieved. Certain solutions cannot reach their full impact at the size of a small neighbourhood like Quayside, while others do not become financially feasible at this smaller scale.

For such reasons, Sidewalk Labs has proposed a concept plan for a wider River District geography, enabling the IDEA District to meet or exceed the ambitious quality-of-life objectives in a way that is both financially achievable and replicable in other parts of Canada and around the world. 



See the “River District” chapter on Page 254 for more details on why scale is necessary to achieve Waterfront Toronto's priority outcomes.

Waterfront Toronto’s RFP recognized the potential need to “take the concepts and solutions deployed on Quayside to scale in future phases of waterfront revitalization.”

Three specific examples of the need for scale include:

1

Climate-positive infrastructure.

This robust infrastructure reduces greenhouse gas emissions by 85 percent in Quayside compared to the status quo. But designing, implementing, and operating the advanced infrastructure systems necessary to achieve climate positivity — which requires exporting clean energy outside a project area — requires a large enough customer base to be effective and financially feasible.

Specifically, to keep Quayside resident energy bills in line with Toronto averages, the advanced power and thermal grids would require a \$19 million supplemental innovation investment based on the current plan, due to factors including the high cost of geothermal exchange and initial electric grid connections, in addition to the poor economies of scale for operating costs.

2

The light rail expansion.

If public funding is not available, an innovative self-financing mechanism could finance this expansion, based on existing city plans, estimated to cost \$1.2 billion.

The idea behind self-financing is to impose a future charge on real-estate value, and borrow in the present against that stream of future funds to pay for part of the cost of construction of the transit system. But Quayside’s proposed development of 10 buildings (roughly 2.65 million square feet) is not large enough to sustainably support the financing of the waterfront light rail.

3

Mass timber production.

As the world’s first entirely mass-timber neighbourhood, Quayside can help demonstrate the feasibility and benefits of this new sustainable building material. But Sidewalk Labs estimates that a larger development area — roughly 6 million square feet — is needed to justify an investment in the factory-based production of mass timber.

This larger area is also necessary for such a factory to hit peak efficiency in producing sustainable building components on a predictable timeline that developers can trust, leading to new value that can be captured for below-market housing.

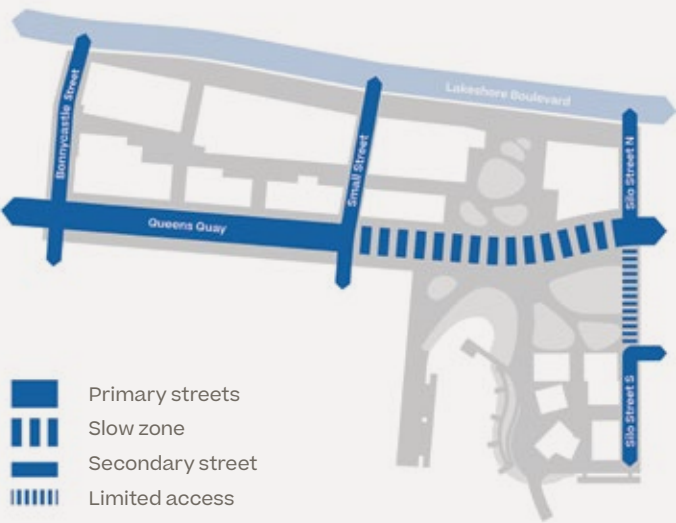
How It Works

The Quayside plan incorporates innovations into its development approach to achieve project goals.

The following section delves into the technical workings of the plan’s proposed innovations around six key areas: mobility, public realm, buildings and housing, sustainability, social infrastructure, and digital innovation.

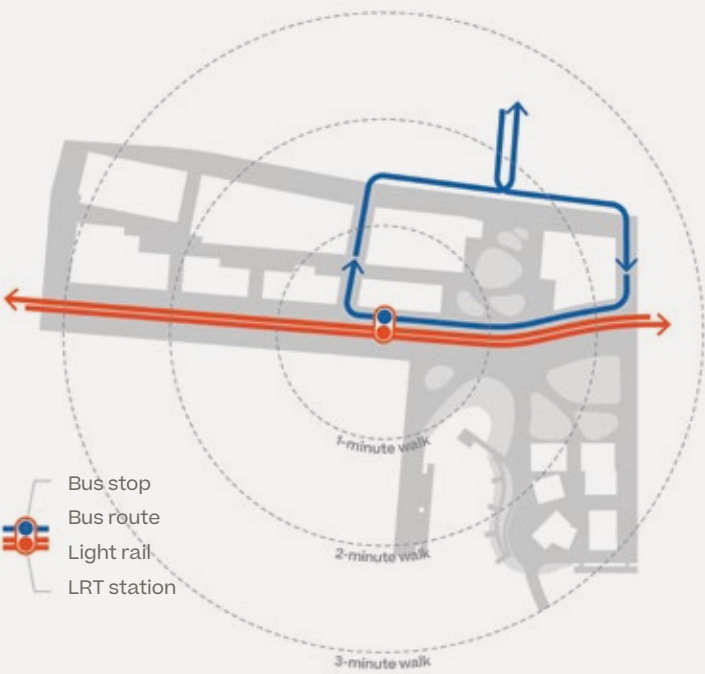
These initiatives are designed to work together to support a comprehensive vision of a neighbourhood that can adapt to the ever-changing needs of its residents and create a more affordable, sustainable, and prosperous community.

The Quayside technical systems



Streets

4 curbless streets



Transit

2 new transit stops
(light rail and bus) on Queens Quay



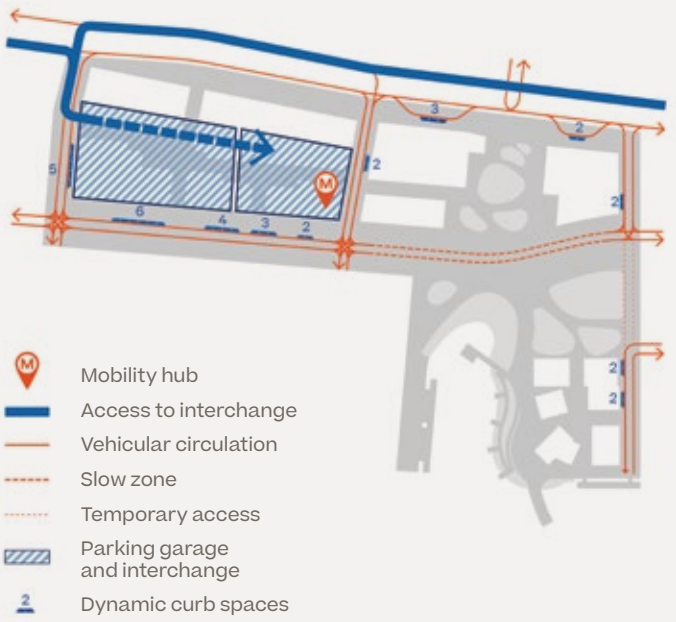
Walking

31,000+ square metres of
pedestrian-accessible space



Lighting

100% responsive lighting



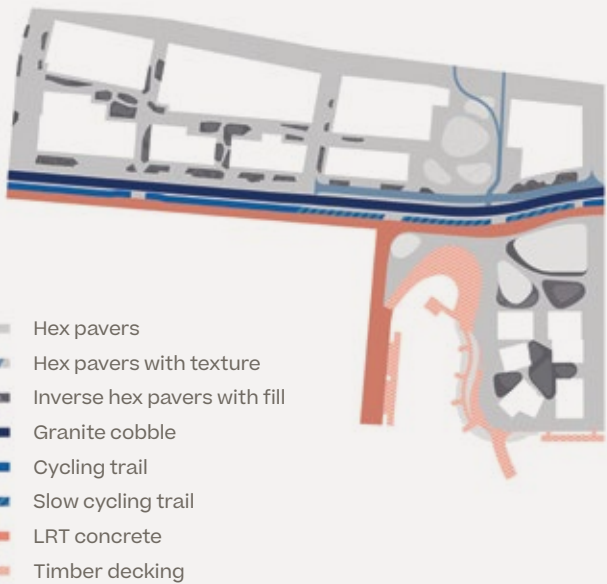
Vehicles

33 dynamic curb spaces and a
vehicular interchange



Cycling

4,000+ bicycle parking spaces



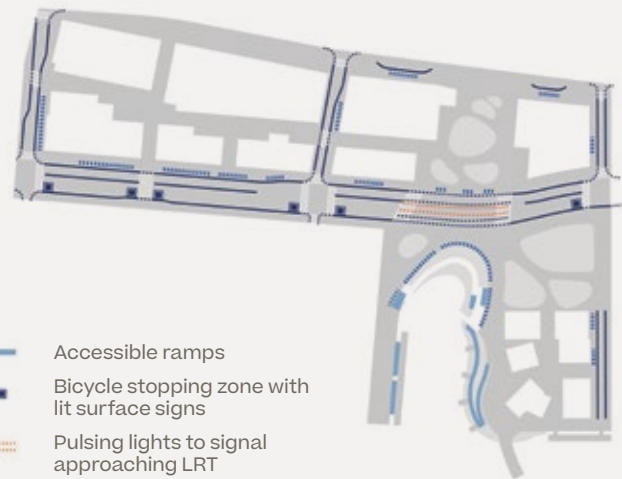
Paving

50% modular streetscape



Planting

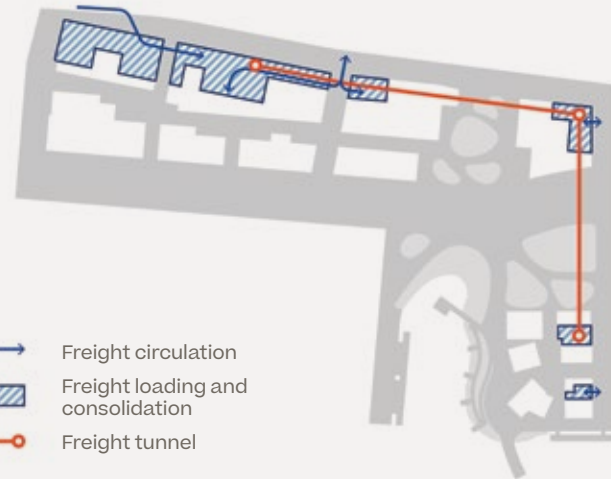
430+ new trees



- Accessible ramps
- Bicycle stopping zone with lit surface signs
- Pulsing lights to signal approaching LRT
- Detectable edge
- Seating, planters, and buffers
- Crossings

Accessibility

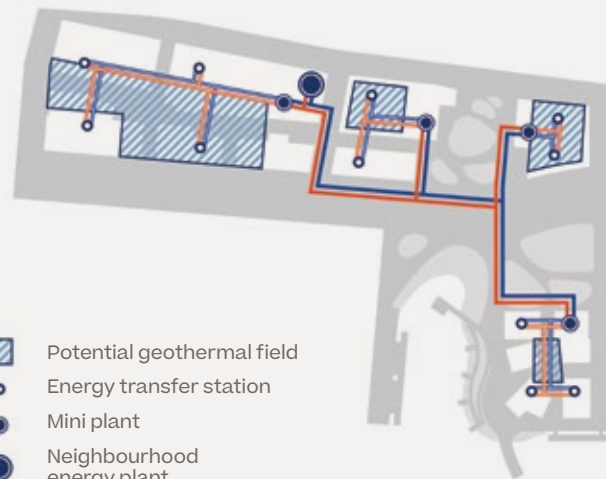
Wayfinding beacons throughout the site



- Freight circulation
- Freight loading and consolidation
- Freight tunnel

Freight

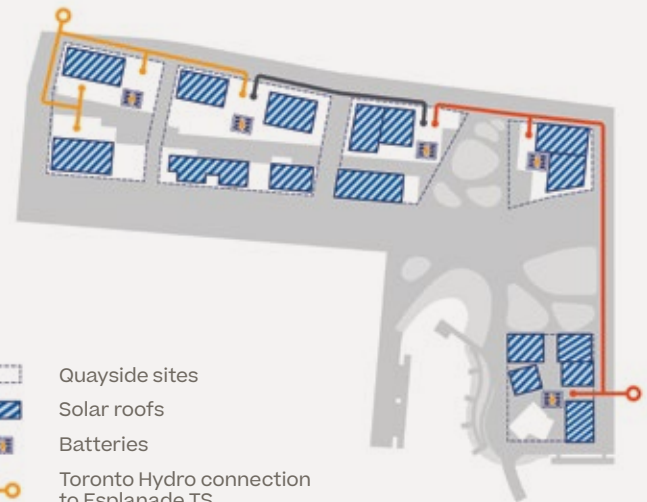
78% on-site truck trip reduction



- Potential geothermal field
- Energy transfer station
- Mini plant
- Neighbourhood energy plant
- Hot / chilled piping
- Ambient piping

Thermal grid

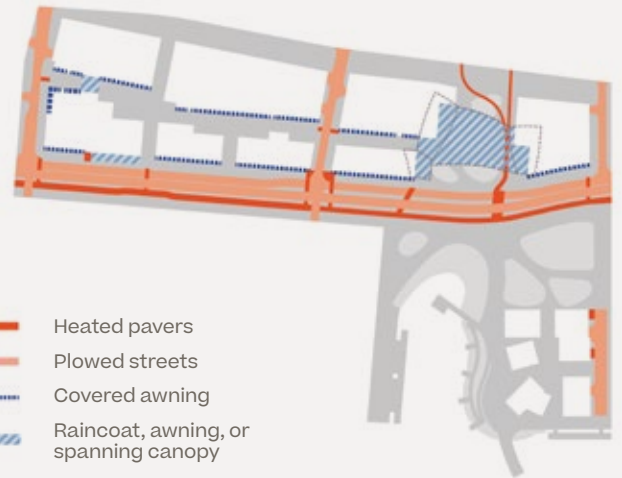
100% clean energy heating and cooling



- Quayside sites
- Solar roofs
- Batteries
- Toronto Hydro connection to Esplanade TS
- Toronto Hydro connection to Basin TS
- Backup connection

Advanced power grid

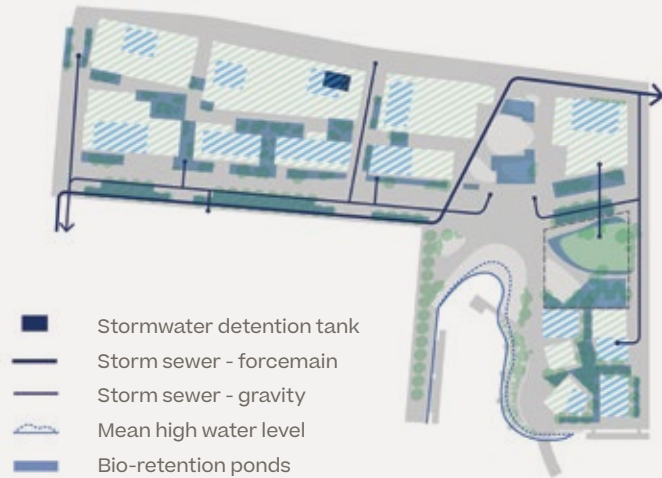
Battery capacity equal to 66% of peak demand



- Heated pavers
- Plowed streets
- Covered awning
- Raincoat, awning, or spanning canopy

Outdoor comfort

35% increase in comfortable outdoor hours



- Stormwater detention tank
- Storm sewer - forcemain
- Storm sewer - gravity
- Mean high water level
- Bio-retention ponds
- Green roof
- Blue roof
- Opportunity for below-grade infiltration

Stormwater

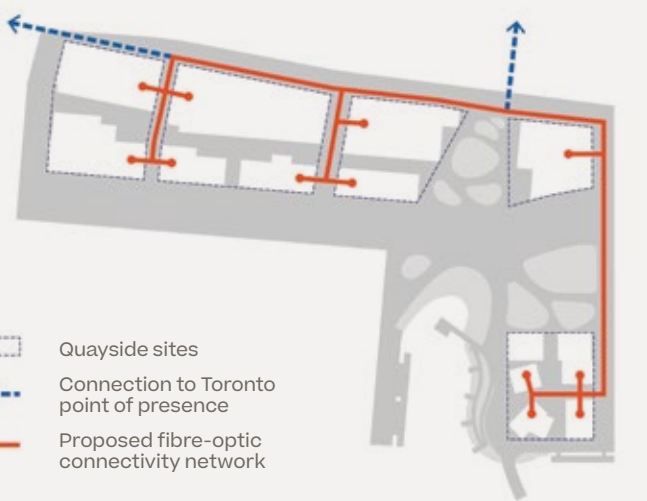
90% on-site stormwater absorption



- Quayside sites
- Waste collection Terminal Station
- Pneumatic waste tubes
- Pneumatic waste public realm inlet
- Freight tunnel for transporting special waste

Waste

80% landfill diversion



- Quayside sites
- Connection to Toronto point of presence
- Proposed fibre-optic connectivity network

Fibre-optic network

Super-fast connectivity network

Mobility



A transportation system that **reduces the need to own a car by providing safe, convenient, connected, and affordable options for every trip.**



See the “Mobility” chapter of Volume 2 for more details on the urban innovations described in this section.

Creating a balanced transportation network that provides convenient, affordable options

The Quayside plan takes an integrated mobility approach designed to offer more choices, lower costs, and better service; to incorporate changing technologies over time; and to provide extensive, easy connections to the surrounding city.

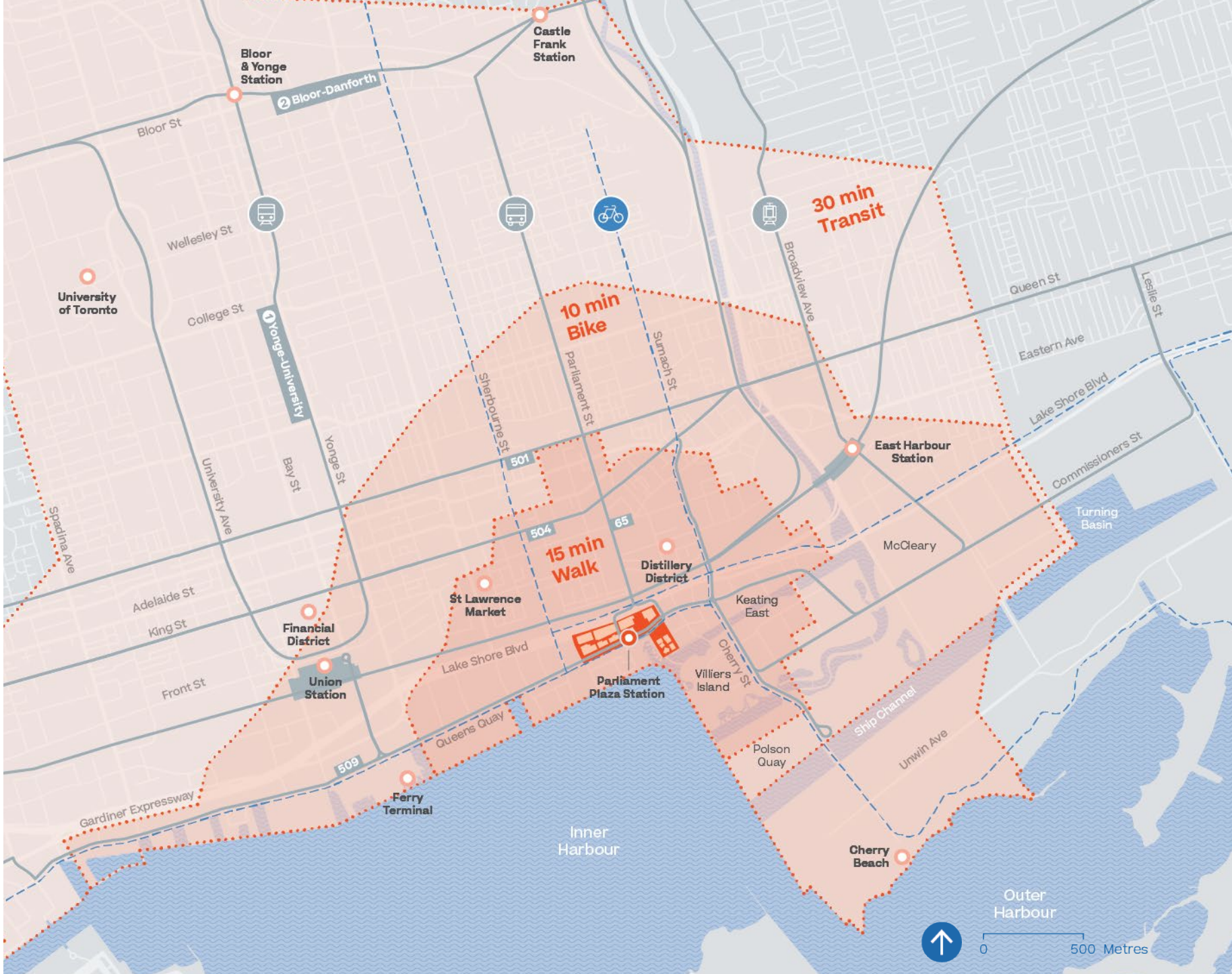
The more growth that Toronto experiences, the harder it can be for the transportation network to fulfill its core mission of helping people get around safely, efficiently, and at a price that everyone can afford.

Traffic congestion costs the greater Toronto area more than \$11 billion a year in lost productivity. Toronto area residents who commute by public transit spend nearly 100 minutes travelling each day.³⁵ Torontonians who live downtown with a car spend, on average, over \$10,000 a year in car-ownership.³⁶ Bike lanes are frequently unprotected and pedestrian walkways are sometimes dangerous.

Toronto’s waterfront has already started to address these challenges, with a redesigned Queens Quay West that includes

a protected cycle path, walkways, and public transit access.³⁷ The Quayside plan would accelerate these improvements by integrating safe street design, innovative policy and financing tools, and cutting-edge technology to create a balanced transportation system that meets the needs of all travellers and can adapt over time.

By providing affordable and safe choices for every trip, Quayside’s transportation network would reduce the need to own a car and set a more sustainable course for urban mobility along the eastern waterfront.



Map
Connecting Quayside to the city: Future pedestrian, bike, and transit travel times

- City transit
- Primary bike routes
- Quayside
- Travel times from Parliament Plaza Station (a new light rail station located near the centre of the neighbourhood)

Source data:
Transit area data from Sidewalk Labs G4ST model
Walk and bike area data from Sidewalk Labs

The Quayside plan expands choices through five main strategies that include physical, digital, and operational innovations.

Physical and digital innovations

Providing robust, multi-modal connections to the surrounding city.

The plan would create new or improved links between Quayside, downtown, and the wider city by extending light rail lines, adding a new bus stop, and enhancing cycling and pedestrian connections. Designated pick-up and drop-off zones within Quayside would help manage curbside traffic congestion and facilitate the use of shared new mobility services. In addition to these options, the Quayside plan features a vehicle interchange with a limited amount of parking for visitors, residents, and workers to ensure vehicle access to the neighbourhood.

Enabling residents to fulfill daily needs within a short walk.

The Quayside plan is designed to enhance walkability by providing a mix of homes, shops, offices, parks, and community spaces — a true live-work neighbourhood. Some of the planning components that enable this walkable urban form include adaptable spaces within buildings and on the lower floors that are designed to accommodate a variety of residential and non-residential uses, high-quality connections to light rail and bus stops, access to schools and health facilities, and an extensive pedestrian network that features wider sidewalks, heated pavement, and lush landscaping.

Designing flexible streets that can adapt to new mobility options.

As transportation technologies evolve to include the increased use of self-driving vehicles or new forms of electric micro-transit, Quayside's flexible streetscape should be able to adapt and rebalance accordingly. To enable future changes to be made with ease, Quayside's streets are designed with removable pavers and extensive digital infrastructure, such as adaptive traffic signals capable of coordinating all travel modes, and dynamic lanes capable of being converted into pedestrian areas.

More detail on these innovations can be found in the How It Works: Mobility pages that follow.

Operational innovations

Helping people make smarter, more cost-effective travel choices.

Quayside residents and employees would have access to a unified mobility package that includes a Toronto Transit Commission (TTC) pass, an unlimited Bike Share Toronto membership, access to e-scooters and other low-speed vehicles, credits for rides with ride-hail or car-share providers, and parking options. This package could be provided through a new mobility app created specifically for the waterfront that features all mobility choices in one place. In addition, open data integrations would allow existing third-party mobility apps to understand real-time prices for each service and provide personalized transportation options to users.

Managing the system holistically.

Sidewalk Labs proposes that a non-profit management entity called the Waterfront Transportation Management Association be responsible for operating all aspects of mobility in Quayside, from establishing safety and traffic congestion goals to offering the mobility subscription package. This entity would operate collaboratively with Quayside residents.

For more details on these operational innovations, see the “Mobility” chapter of Volume 2.

Sidewalk Labs analysis

Using modelling to develop Quayside's mobility plan

To help design its transportation network, Sidewalk Labs used a model called the Greater Toronto Area Model 4.0 for Sidewalk Toronto, or G4ST, in addition to more traditional analysis tools. This model builds on the official GTA Model 4.0 developed by the University of Toronto, which is used as the official model of the city to understand how new developments can impact the transportation system.³⁸

How it works. G4ST uses a representative sample of travel behaviour to simulate the travel patterns of residents, workers, and visitors coming and going from Quayside, including trip modes (such as car, transit, cycling, and walking), routes, and origins and destinations.

What is new. On top of these basics, G4ST incorporates some new elements specific to the Sidewalk Toronto project, such as the potential performance of transit service patterns, costs of self-driving fleets, and the effectiveness of parking and curbside pricing.

Its limitations. All models are simplifications; for example, no one can predict the impact of new regulations on travel behaviour or the emergence of new technology with full accuracy. The G4ST model is an attempt to represent travel demand and decisions, but Sidewalk Labs recognizes that modelled mode shares and results are best seen as indicators of outcomes rather than perfect projections.

How it helps. G4ST has helped inform planning decisions for some essential features of Quayside's mobility network, such as the number of curbside spaces, vehicle lanes, bike lanes, bike-share stations, and bike-parking spaces, as well as the layout of roads.

What it shows. Based on all these inputs, G4ST shows that private car usage would be 13 percent in Quayside, down 16 percentage points from what would be expected from standard development, enabling the neighbourhood to devote more space to housing, public uses, cycling, and walking.

Expanding transit connections between Quayside and the city

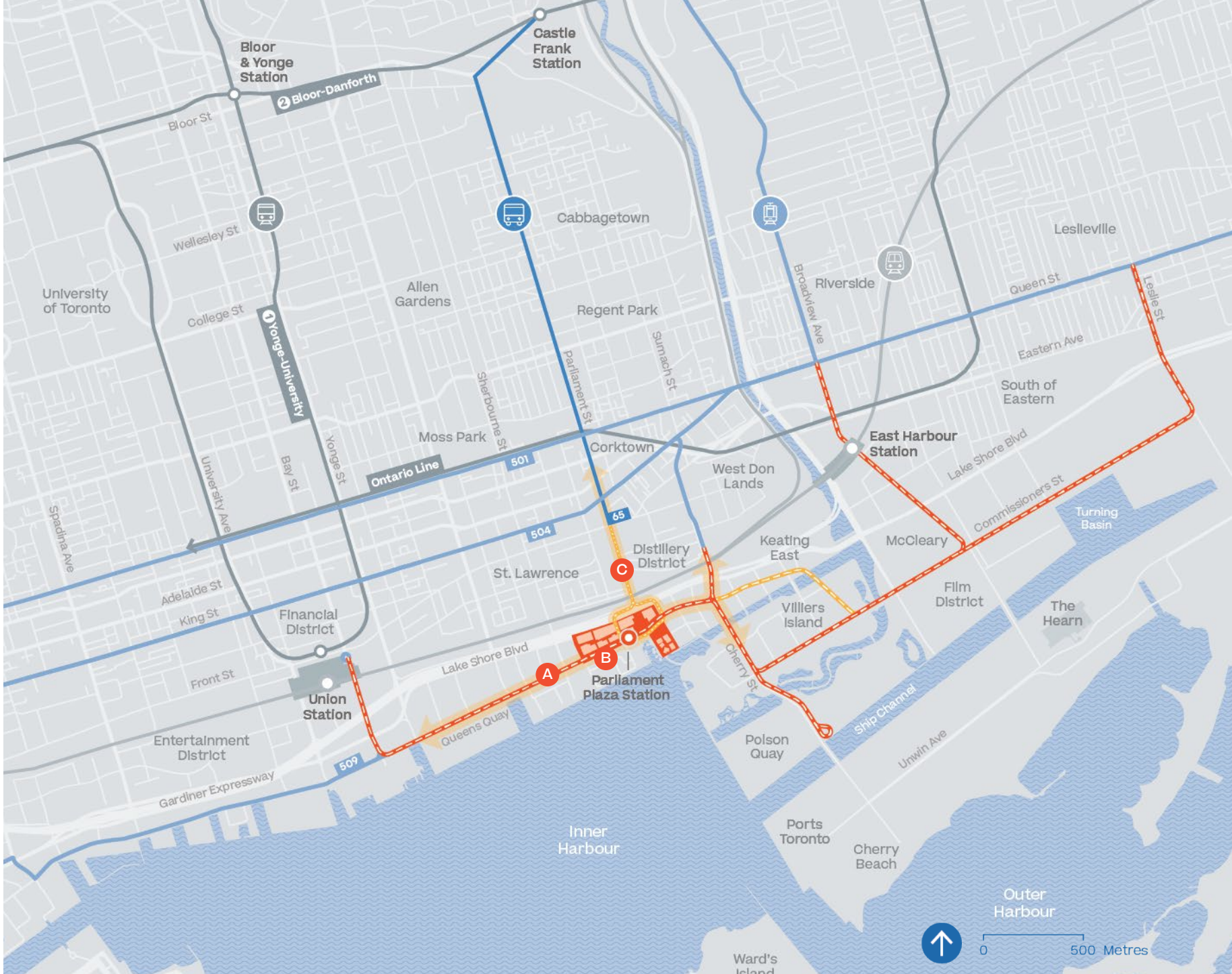
Extending Toronto’s existing public transportation system would establish Quayside as an integral downtown neighbourhood whose jobs and waterfront spaces are accessible to all.

Public transit is the most efficient way of travelling through dense urban neighbourhoods: it serves the most people, at the most affordable cost, with the least environmental damage. For more than a decade, Toronto has planned for a light rail extension to support development along Queens Quay East, but the project remains unfunded.³⁹

Sidewalk Labs’ plan to address this challenge begins by advocating the construction of 6.5 kilometres of light rail transit proposed in the Waterfront Transit Network Plan, including a new Quayside-Parliament Plaza stop. Beyond the approved plan, Sidewalk Labs further proposes an optional second phase of construction to add light rail infrastructure to the area north of the Keating Channel to serve future development. These expanded plans can be pursued at a total estimated cost of approximately \$1.2 billion (roughly \$1.3 billion if the optional Sidewalk Labs link were included).

This proposal advocates that Toronto use the innovative funding mechanism of self-financing, sometimes referred to as “value capture,” to finance this plan. The idea behind self-financing is to impose a future charge on real estate development and borrow in the present against that stream of funds to pay for part of the cost of construction of the transit system. Sidewalk Labs is prepared to assist with the financing of this project. The light rail would remain owned and operated by the TTC.

To provide a high-quality rider experience, Sidewalk Labs also seeks to work with the TTC to test and implement a broad range of light rail enhancements, such as wider platforms with seating bars, weather protection, and electronic information displays.



Map Quayside light rail and bus connections

- GO Transit / SmartTrack
 - Subway (existing and planned)
 - Existing
 - Approved extension
 - Optional
 - Existing
 - Proposed by Sidewalk Labs
 - Quayside
 - Parliament Plaza Station
- Light rail
- Bus

A Expanding light rail transit. The city’s high-capacity light rail system would be extended into Quayside via the 509 (Harbourfront) line and the 504 (King Street) line, operated by the TTC. These extensions into Quayside are part of existing city plans but would be accelerated through Sidewalk Labs’ proposed self-financing approach. The Quayside extension would be the first leg of new transit lines to be extended further south and east into the Port Lands, following approved plans by the city and new plans proposed by Sidewalk Labs.

B New light rail stop. A new Quayside-Parliament Plaza stop would connect the neighbourhood to major areas like downtown, the exhibition area, the King Street business area, and Union Station, as well as to the Bloor-Danforth (Line 2) subway line, the future East Harbour SmartTrack station, and the Sumach Street station on the proposed Ontario Line.⁴⁰

C Local bus. A new bus stop for the 65 bus route would be located on Queens Quay at Parliament Plaza, adjacent to the light rail stop, and could be used by the 72 bus until the Light Rail Transit extension is complete.

Prioritizing pedestrians to create a walkable community





Quayside’s extensive pedestrian network is designed to put daily essentials and many jobs within a six-minute walk of every building and provide safe, comfortable connections to surrounding neighbourhoods.

Quayside is within walking distance of many important destinations, but people’s willingness to walk is driven more by experience than by distance: if walking is pleasant and safe, people will walk. Especially in the winter, harsh weather can add an additional barrier to walking outside. The Quayside plan integrates design, policy, and technology advances to make walking easier, safer, and more enjoyable year-round.

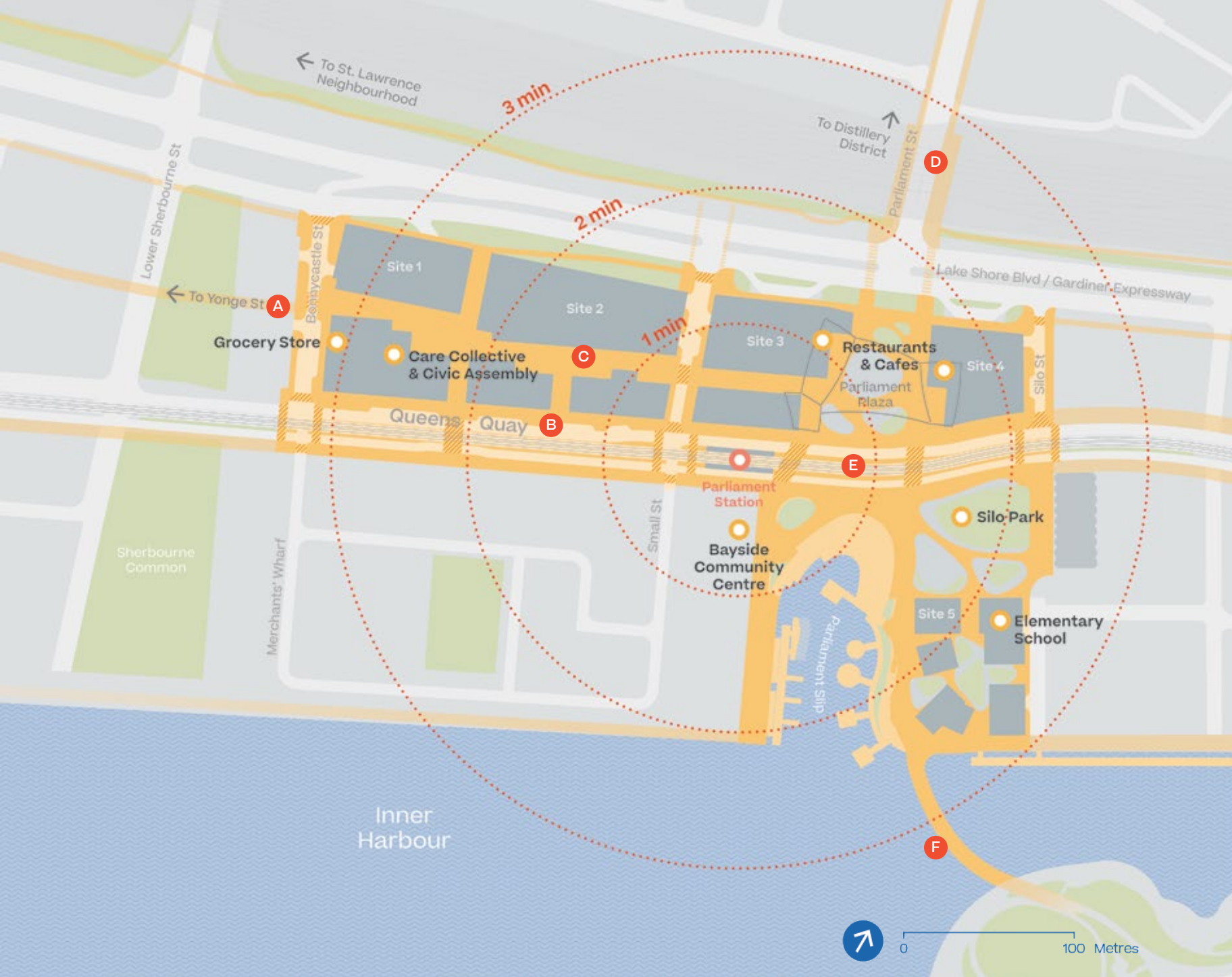
In the plan, weather-protected walkways — enlivened by shops, plazas, parks, cafés, and community spaces — would make every part of the site accessible and link to adjacent neighbourhoods. A new grand public space, Parliament Plaza, would prioritize pedestrians and feature a “slow zone” through which the light rail, cars, and bikes move closer to pedestrian speeds. Pedestrians and cyclists would be given priority at traffic crossings by responsive traffic signals. Adaptable buildings designed to accommodate offices, homes, shops, community spaces, schools, and health facilities would ensure that everyone in Quayside could fulfill daily needs within a short walk.

Drawing people outside in these ways would not only improve the pedestrian experience but enliven the streets, fill shops, and create the unexpected encounters that fuel great cities.

Map Quayside pedestrian network

-  Pedestrian access
-  Quayside pedestrian crossings
-  Quayside points of interest
-  1-minute walk radii from Parliament Station

- A Walking from Yonge Street.**
The network of pedestrian paths running parallel to Queens Quay from Yonge Street would be extended through Sites 1 to 3 in Quayside, becoming a pedestrian-only courtyard filled with shops and community spaces that culminates in Parliament Plaza.
- B Creating a linear plaza.**
When Quayside opens, Queens Quay’s north sidewalk would be more than 7 metres wide — almost twice the size of present precinct plans. In the future, when self-driving vehicles share the road with light rail transit and car lanes can be reclaimed as sidewalk space (see Page 356), this area would grow to become a linear promenade more than 14 metres wide.⁴¹
- C Pedways and courtyards.**
Bustling, car-free pedestrian walkways and courtyards connect all areas of Quayside, breaking down large block footprints and creating a greater sense of intimacy.
- D Improving underpass connections.**
Currently, to reach Quayside from the north, visitors must travel through dark, narrow, noisy railway underpasses and cross the wide intersection of Lake Shore Boulevard. Sidewalk Labs plans to renovate the underpasses into bright, active corridors to create a more inviting connection.



- E Queens Quay slow zone.**
Queens Quay between Small and Silo streets, crossing through Parliament Plaza, would be designated as a slow zone. The light rail, vehicles, and bicycles would cross through the wide, open plaza travelling no faster than 10 km/h — closer to the walking speed of pedestrians. In this zone, vehicle and bike lanes would narrow and varied paving colours, patterns, and textures, as well as dynamic lighting, would alert drivers and cyclists to slow down. Two clearly defined crossing areas at the west and east edges of the plaza would provide primary areas for pedestrian passage and be marked for accessibility.
- F Connecting to Villiers Island.**
Pathways would lead to a new pedestrian bridge that connects Quayside to the stunning new parks of Villiers Island.
- 3 Minutes.**
A household in Quayside should be able to reach many daily needs within a three-minute walk from the neighbourhood centre, such as the elementary school, a grocery store, and almost 3,900 jobs.

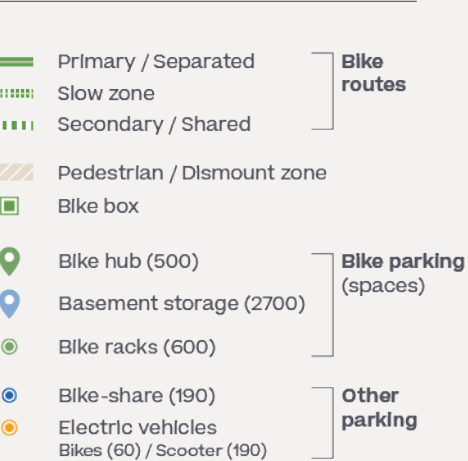
Creating a safer, connected cycling network

Quayside’s proposed cycling network connects seamlessly to surrounding neighbourhoods while piloting new designs and technologies to make cycling smoother, safer, and more convenient across all seasons.

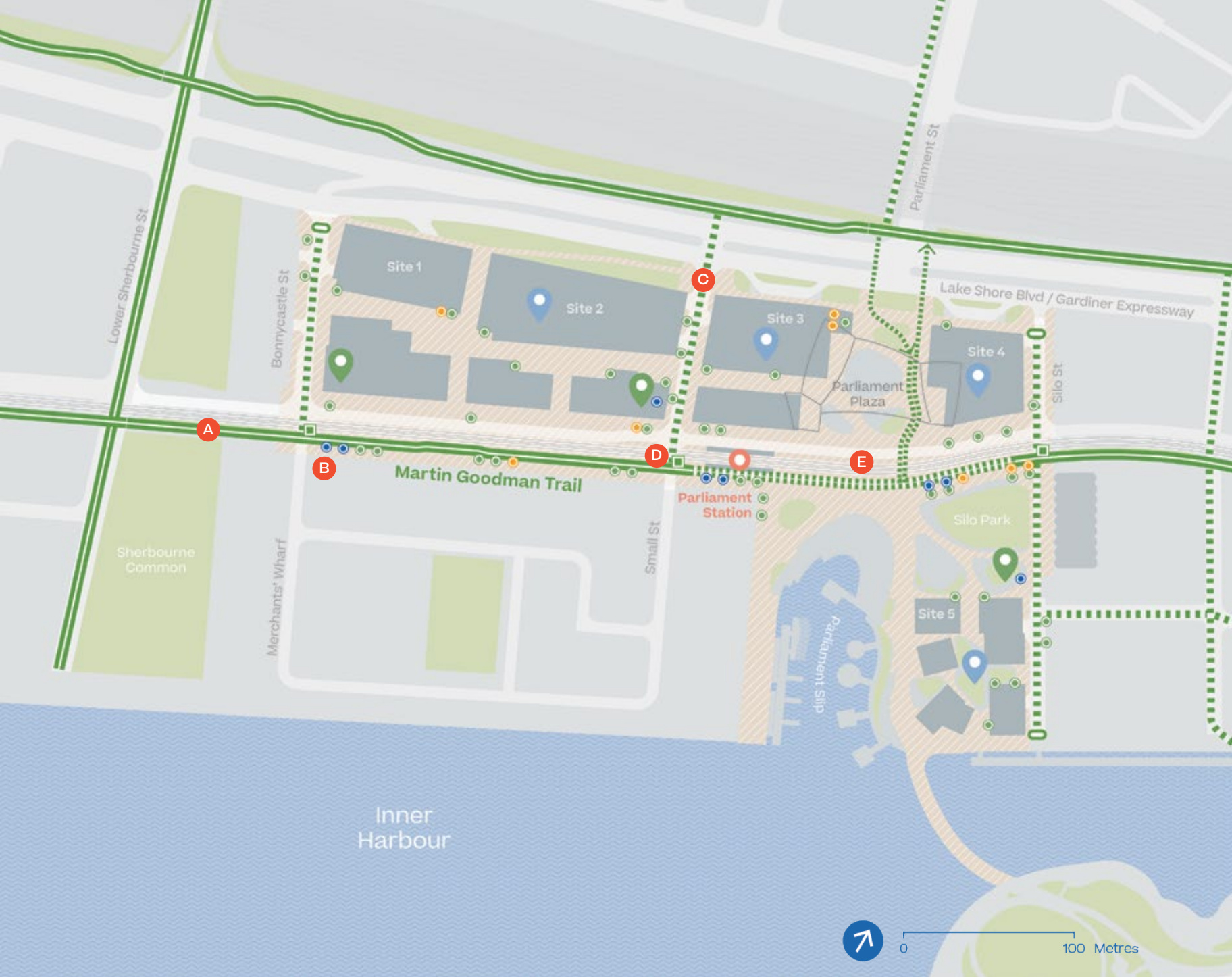
Pedestrians and cyclists along the waterfront face steep challenges in the form of connectivity, safety, and comfort — from unprotected lanes to freezing, snowy days. Waterfront Toronto has started to tackle this challenge along Queens Quay West, with new protected bike lanes that attract more than 6,000 riders a day.⁴² The Quayside plan builds on this progress by piloting a series of innovations to protect cyclists and create safe and convenient connections with the rest of Toronto.

The plan’s heated bike lanes would make cycling comfortable and safer for more of the year. Wide, physically separated lanes would protect cyclists from traffic. “Green wave” lighting would help cyclists avoid hitting red lights and guide them safely through crossings. Responsive traffic signals would give cyclists and pedestrians priority over cars at intersections. And extensive bike infrastructure — including bike-share stations, bike parking, and e-bike options — would support riders and ensure seamless transfers to other travel modes.

Map
Quayside bicycle network and facilities

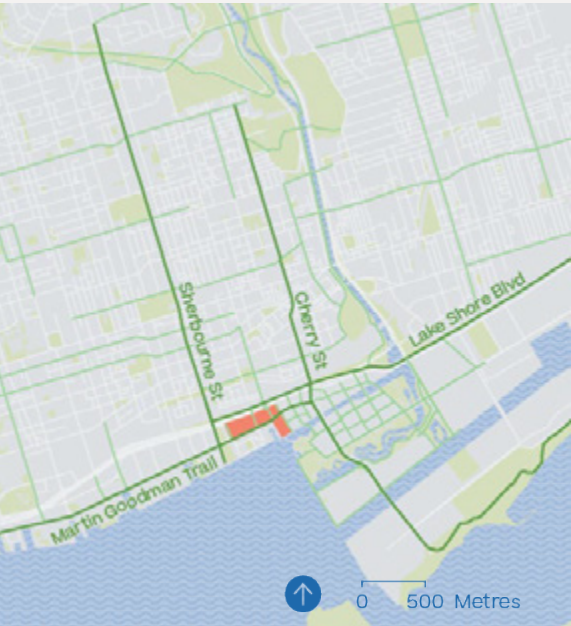
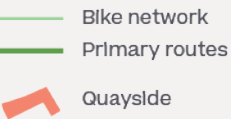


- A Martin Goodman Trail.** For the trail’s four blocks through Quayside, cyclists would notice that their trips become more comfortable thanks to a series of pilots, such as doubling capacity on the trail to allow riders to pass each other safely, green waves that enable continuous biking, and heated pavers to melt snow and ice.
- B Bike parking.** To encourage cycling as a primary form of transit, the Quayside plan provides more than 800 short-term and almost 3,000 long-term bike parking spaces on site (more than one per residential unit).⁴³ This amount meets Toronto Green Standard Tier 1 for long-term residential bike storage and represents almost 70 percent more short-term bike parking spaces than required by city standards and almost 20 percent more spaces overall.⁴⁴
- C Low-speed streets.** Cyclists can travel through Quayside’s north-south side streets alongside pedestrians and cars travelling at reduced speeds.
- D Protected turns for cyclists.** Cyclists travelling north along Bonnycastle or Small Streets would be protected by bike boxes at the Queens Quay-Martin Goodman Trail intersections, separating cyclists from vehicle turning paths.



- E Queens Quay slow zone.** As described on Page 111, all modes would share space in the slow zone along Queens Quay, through Parliament Plaza, at a reduced speed of 10 km/h. For cyclists, a new north-south trail through the plaza would connect to the Martin Goodman Trail and be marked with coloured pavers and dynamic lighting. Bike parking and bike-share stations around the edge of the plaza would enable cyclists to easily pick up and drop off bicycles.

Bike network. Sherbourne and Cherry streets, as well as a path through the new Parliament Plaza, connect cyclists to the Martin Goodman Trail, which runs through the heart of Quayside parallel to Queens Quay.



Ensuring vehicle access to Quayside

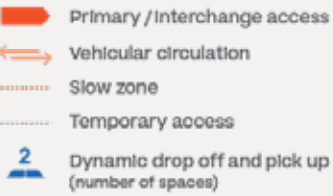
Quayside’s proposed vehicular facilities and street network would create connections along the waterfront for drivers while protecting pedestrian and cycling spaces and minimizing the need for privately owned cars.

Quayside’s transportation network is designed to prioritize public transit, cycling, and walking. But Sidewalk Labs recognizes that traditional cars — and, in the future, self-driving vehicles — play a part in any comprehensive mobility system.

That means providing network connections to downtown and across the eastern waterfront; offering facilities that prioritize new mobility options, such as ride-hail and car-share services; and facilitating connections to bikes, scooters, and walking paths for travellers leaving from or arriving into the neighbourhood.

The resulting system would provide easy circulation throughout the city and access to vehicles for trips that require them — like transporting an elderly parent to the hospital or travelling to the airport with lots of luggage — while minimizing the need for private car-ownership.

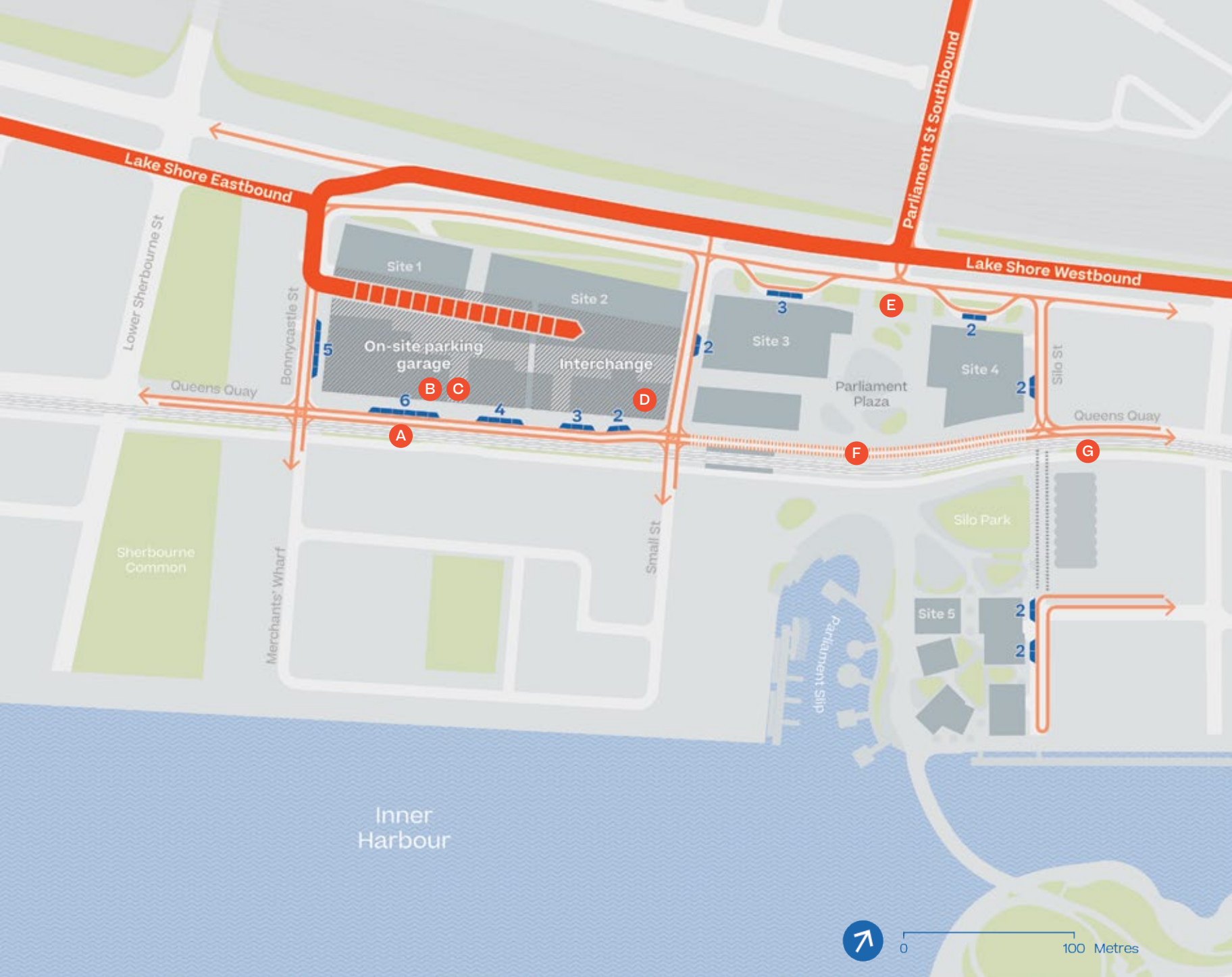
Map
Quayside vehicular network and facilities



A On-street pick-up and drop-off. Pick-up and drop-off spaces would be available on Queens Quay, with additional sites at Lake Shore Boulevard, Bonnycastle Street, and Small Street. Availability would be monitored, priced, and communicated in real-time to travellers via apps, as well as to new mobility services.

B Electric vehicle facilities. To support climate-positive goals, all parking sites would offer extensive electric vehicle charging facilities — enough to meet Toronto Green Standard Tier 2 (25 percent of spaces enabled and all spaces capable of connection). At the on-site garage, Level 3 chargers (which require 1 hour to charge) and Level 2 chargers (which require 3.5 hours to charge) would be available for car-share vehicles, taxis, shuttles, electric buses, and electric mini-buses. To encourage car-sharing and meet environmental goals, almost 100 car-share vehicles would be available at the on-site parking facility and would be all electric. At the off-site facility, Level 1 chargers (which take 10 to 12 hours to charge) would be available. Discounts for these parking facilities would be provided to Quayside residents and employees who own electric vehicles.

C Hourly (on-site) parking. An underground parking garage with some 400 spaces would be accessible via Bonnycastle Street; intended mainly for visitors, this garage would charge hourly rates and offer monthly spaces for accessible parking or other exceptions.⁴⁵



D Off-site parking access. Residents and employees requiring monthly parking for personal vehicles could access their cars at the proposed “interchange” (see Page 117), where an attendant (scheduled in advance via app) would convey the vehicles to and from off-site parking spaces (750 total) located in the Port Lands or nearby.

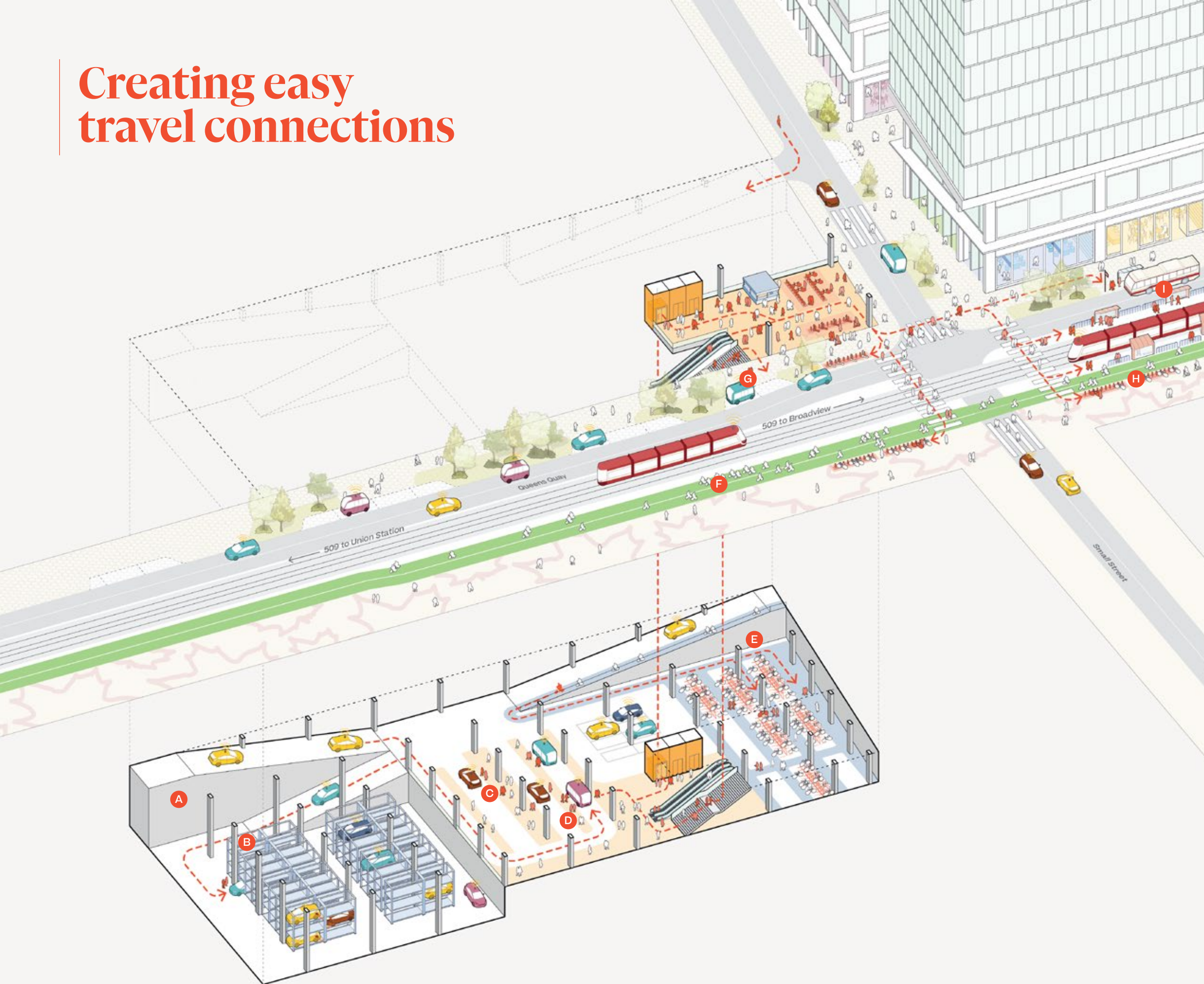
E Parliament Street closure. To support a safer, livelier transit, bike, and pedestrian experience and create a grand neighbourhood public space at Parliament Plaza, the Quayside plan proposes a closure of Parliament Street with traffic diverted to Small and Silo streets

in a loop, via traffic signal management able to respond in real-time to changing conditions. (See Page 143 for details.)

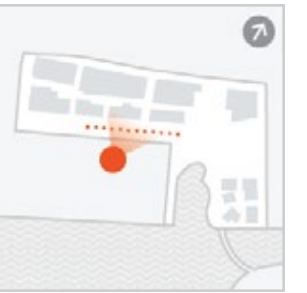
F Queens Quay slow zone. Traffic lights at the intersections of Queens Quay and Small and Silo streets would operate to allow limited numbers of cars into the proposed slow zone running through Parliament Plaza (see Page 143). To ensure safety, pedestrians would be given priority in this zone and vehicles would move along the street at reduced speeds of 10 km/h.

G Queens Quay adaptation. Queens Quay would be designed to adapt in the future. When self-driving cars become the norm — based on successful pilots and approved operation design — Sidewalk Labs anticipates that these vehicles could share the roadway with light rail. At that time, Queens Quay’s vehicular lanes would be repurposed as a linear pedestrian plaza. (See Page 123 for details.)

Creating easy travel connections



Quayside's multi-modal mobility hub



In the heart of Quayside, a nexus of bike-share stations, pedestrian paths, light rail and bus stops, a parking garage, and ride-hail pick-up and drop-off points would enable easy transfers across every travel mode.

The Quayside plan anchors the transportation system around a mobility hub for drop-offs, pick-ups, and transfers located in the bustling centre of the neighbourhood.

Travellers who arrive to Quayside by car or public transit can rent bikes or scooters to complete the last leg of their trip, or choose to walk through the expanded and improved pedestrian network.

Alternatively, residents can use bikes and scooters to arrive at the mobility hub, where they could board a light rail vehicle or bus — or access personal, shared, or hailed vehicles — to reach destinations across the Greater Toronto Area.

A Parking garage.

An hourly-rate parking garage, complete with electric vehicle charging, could accommodate some 400 cars. This on-site garage would be designed with stacked parking, requiring vehicles to be dropped off with and picked up from parking attendants.

B Car-sharing.

To facilitate access to car-sharing services, nearly 100 car-share spaces would be included in the garage.

C Vehicle interchange.

The interchange, a below-grade drop-off and pick-up area, would be co-located with the visitor parking garage and have a peak capacity of 500 vehicles per hour.⁴⁶ The underground location keeps cars off the road and frees up space for the public realm and building ground floors.

D Ride-hailing.

To facilitate access to ride-hailing services, taxis and shuttles would have designated interchange spaces located conveniently near the entrance / exit.

E Bike hub.

The bicycle hub includes bike parking, bike-shares, e-bikes, and e-scooter racks.

F Martin Goodman Trail.

Protected five-metre bicycle lanes would double the capacity of traditional bike paths.

G Pick-up and drop-off zones.

More than 30 pick-up or drop-off spaces would be located around Quayside.

H Electric bikes and e-scooters.

Some 250 spaces for these new mobility devices would be provided across Quayside.

I Transit connections.

A new Queens Quay light rail station and city bus stop would be located at the mobility hub.

→ Multi-modal connections.

Connections to every type of mobility option are available in the hub area.

Establishing a people-first street network

Quayside’s balanced street network integrates digital and design innovations to create a welcoming, safe public realm while facilitating movement for all modes of travel.

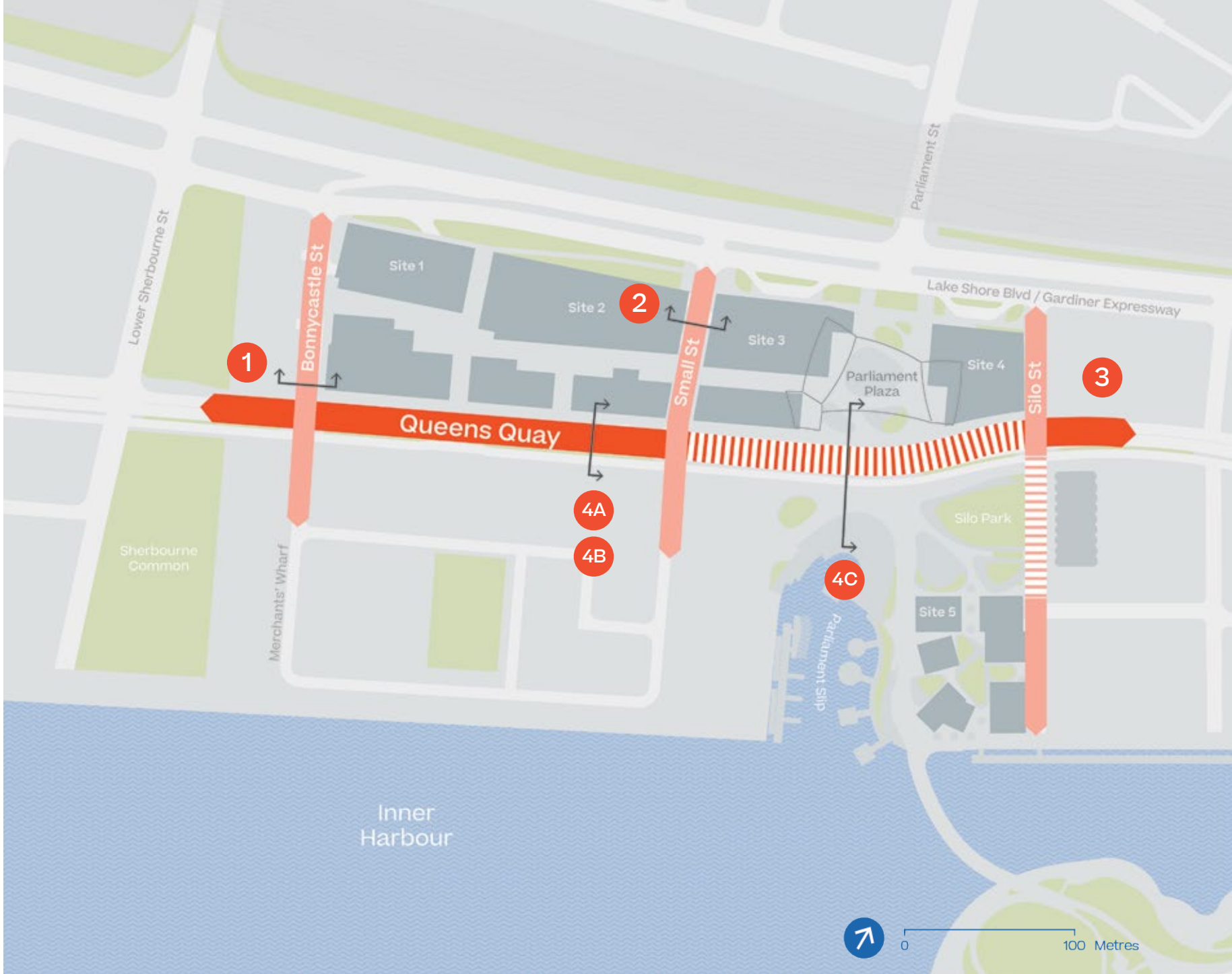
Most streets have a single, static design, yet they are expected to serve an ever-shifting group of users, whose needs change and conflict over the course of a day. In the morning rush hour, the number of transit and private vehicles on the streets is much higher. During the afternoon, there are likely to be more pedestrians using the sidewalk for errands and strolls. Whether exploring or commuting, cyclists should be protected at all times.

Typical street designs cannot respond to these varied demands. Instead, they tend to feature wide, permanent car lanes to accommodate peak traffic needs at the expense of public space.

Quayside’s people-first approach creates a balanced street network designed to incorporate the needs of all users and adapt as conditions evolve. Dynamic curbs can provide flexibility to make

the most of limited street space, enabling quick conversions between transportation and public realm purposes like plazas or special events like pop-up markets. By planning streets around public transit use and shared mobility fleets, not private car-ownership, Quayside can reclaim street space for wide sidewalks and safe cycling routes.

This approach is designed to operate safely and effectively in existing cities with traditional vehicles, however, it reaches its peak potential in a world of self-driving vehicles that can be programmed to follow traffic rules, be routed by a mobility management system, and defer to pedestrians.



Map Quayside’s street plan

Quayside’s proposed street network consists of one grand boulevard that runs east-west (Queens Quay) and three north-south streets that provide convenient building access.

- Queens Quay
30m wide, 40km/hr
- Slow zone
- North / South streets
16-20m wide, 20km/hr
- Temporary roadway
during construction of sites to east

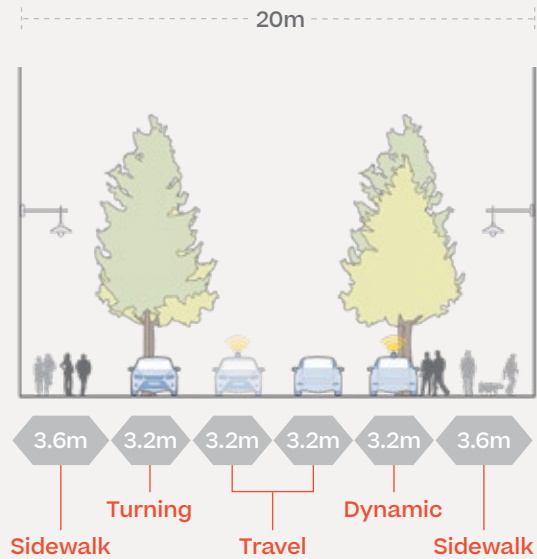
- 1 Bonnycastle Street
- 2 Small Street
- 3 Silo Street
- 4A Queens Quay 2025
- 4B Queens Quay 2035
- 4C Queens Quay slow zone 2025

See street sections on the following page

Designing Quayside's four streets

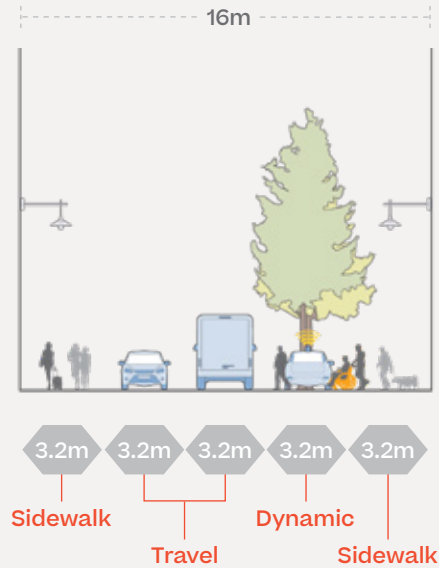
1

Bonnycastle Street.
Bonnycastle would have north- and south-bound vehicle lanes and multiple dynamic curb spaces.



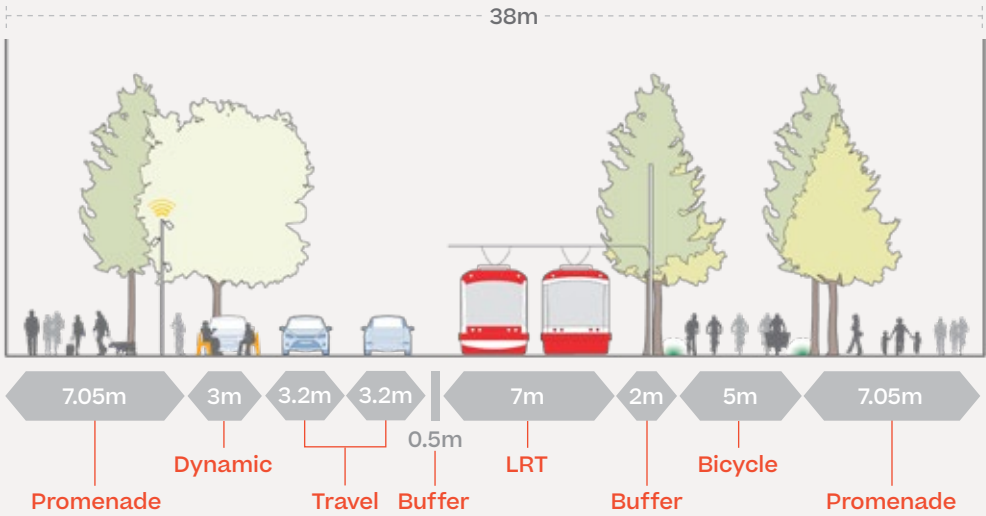
2 3

Small and Silo streets.
Quayside's two smallest streets would share space among pedestrians, cyclists, and cars, with slower vehicle speeds. Trucks exiting from the neighbourhood logistics hub (see Page 134) would pass along Small Street.



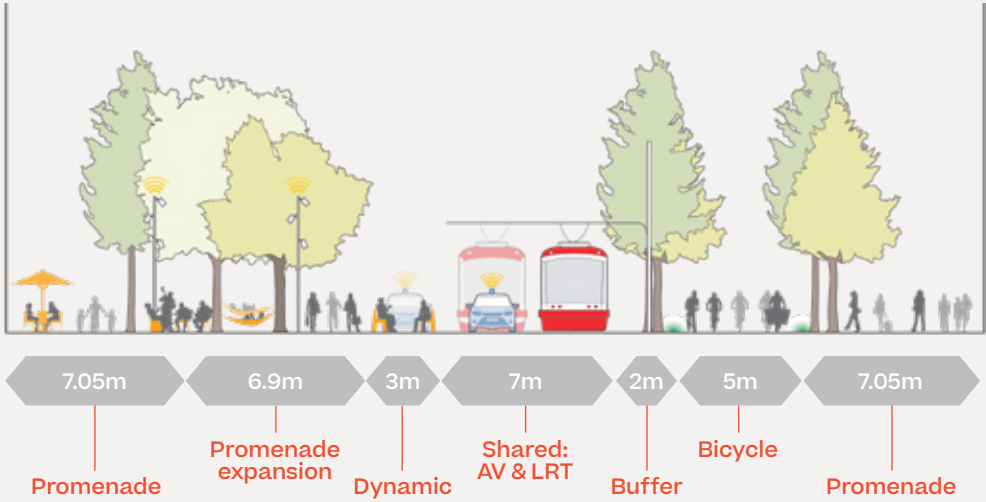
4A

Queens Quay 2025.
The initial plans for Queens Quay feature wide sidewalks and bike lanes, as well as plentiful dynamic curb spaces along the north side of the street.



4B

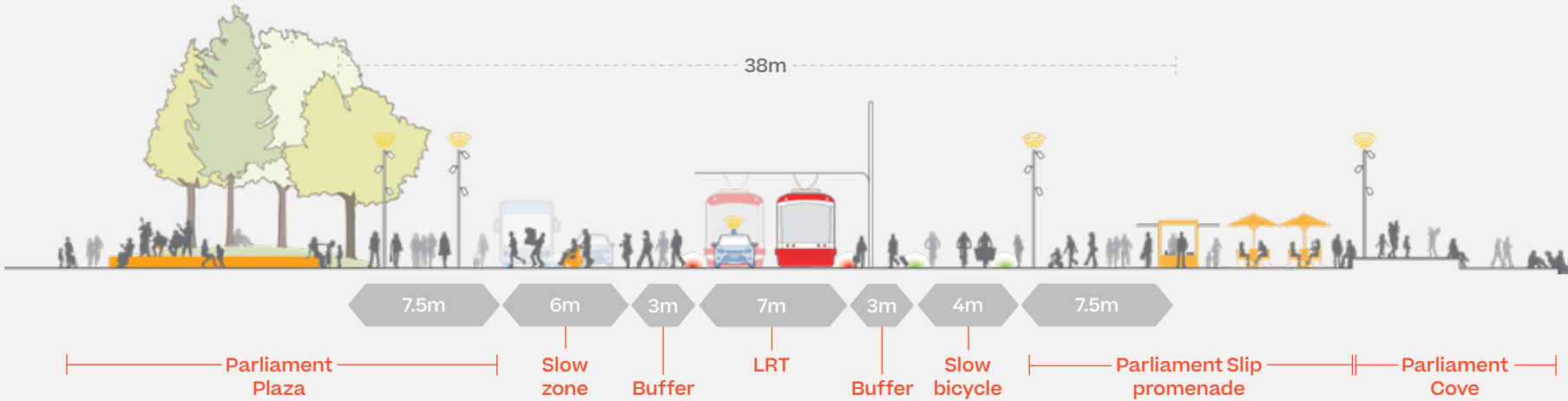
Queens Quay 2035.
In the future, when self-driving vehicles are able to replace traditional cars and share space with the light rail transit lanes without impeding operations, the two traffic lanes would be converted to pedestrian space.



4C

Queens Quay slow zone 2025.
As described on Page 123, light rail, vehicles, and bicycles would cross through Parliament Plaza along the Queens Quay slow zone, sharing the space with pedestrians at a

reduced speed of 10 km/h. Buffer zones between travel lanes would act as additional safety features for pedestrian crossing areas, and “red waves” would alert pedestrians to the light rail’s arrival.



Reimagining Queens Quay for 2025 and 2035

Quayside's plans accelerate improvements already underway to transform Queens Quay into a vibrant boulevard that welcomes pedestrians, bikes, and public transportation and provides a grand entrance to the eastern waterfront.

Queens Quay is the major boulevard connecting public spaces and neighbourhoods along the waterfront. Farther west, the street has seen major improvements over the last 10 years, resulting in safer conditions, enhanced public transit service, and better cycling conditions.

The Quayside plan builds on these improvements to create an inspiring entrance to the eastern waterfront, a street purposely designed to evolve over time and capture the opportunities provided by a future with self-driving vehicles. On opening day, travellers could enjoy the newly extended streetcar line,

superior cycling and pedestrian experiences, and access to new ride-hail services. An expanded public realm would blur the line between sidewalks and building ground floors, which can host a range of micro-shops, major retailers, cafés, community spaces, and art and cultural installations.

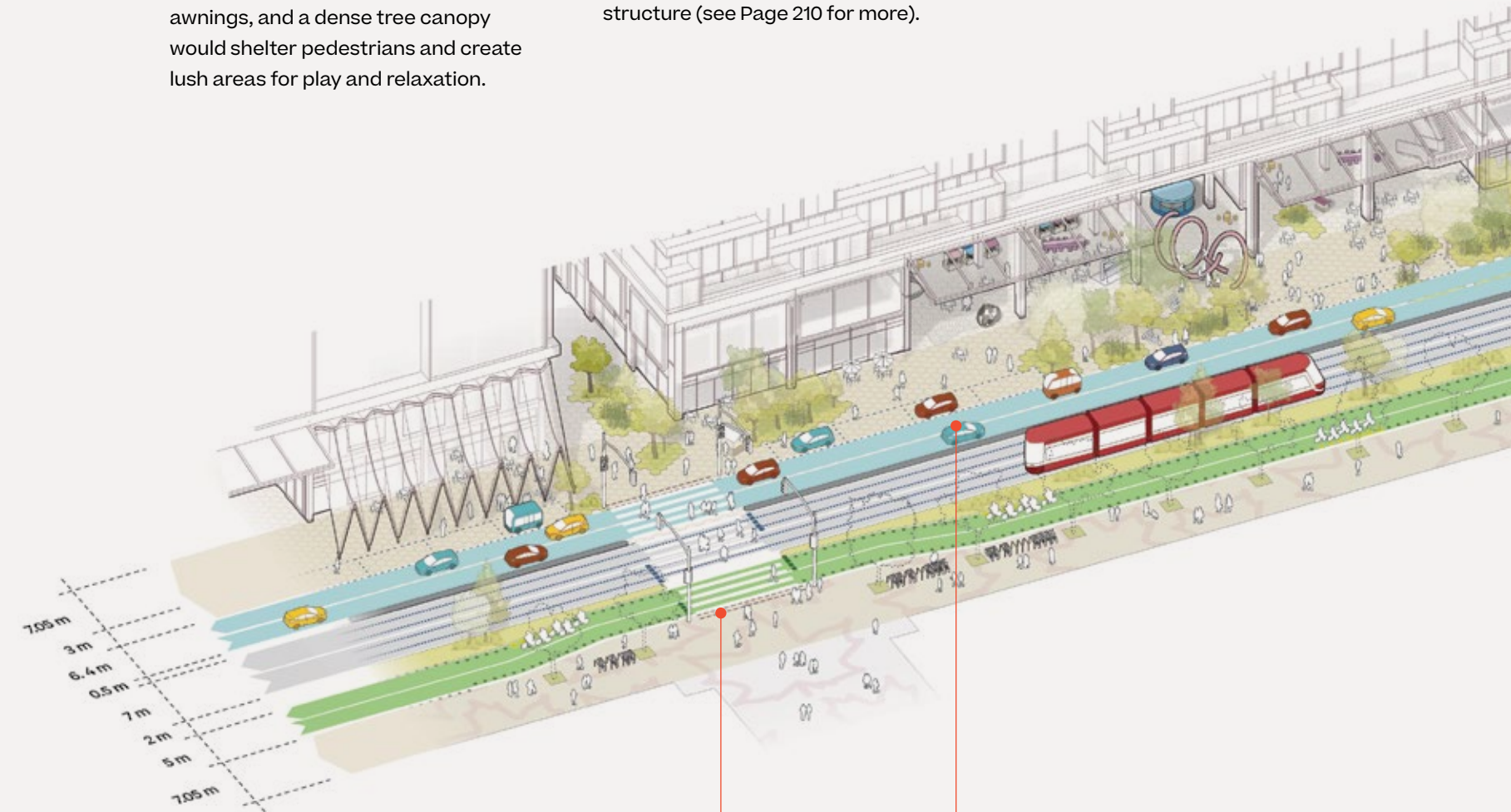
Over time, as new transportation options and self-driving vehicles emerge, the street could recapture car lanes to create a bigger, more varied public realm.

2025

Queens Quay on Day One

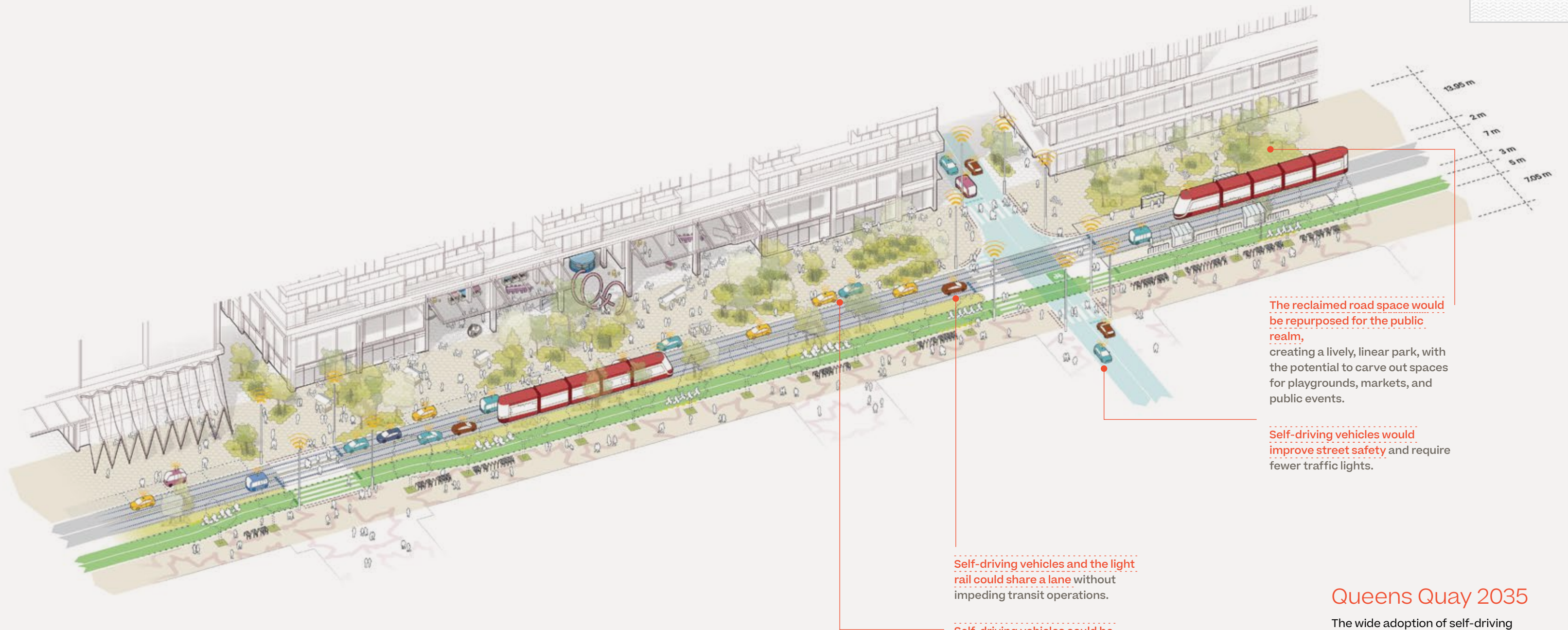
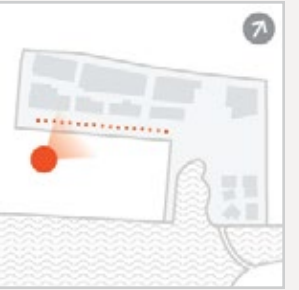
Upon opening, Queens Quay would retain two east-west vehicle lanes to ensure connectivity across the waterfront. Building Raincoats, movable awnings, and a dense tree canopy would shelter pedestrians and create lush areas for play and relaxation.

During slower midday and weekend times, the numerous dynamic pick-up and drop-off zones could be repurposed for programming like outdoor cafés or pop-up shops. Expansive landscaping would also form the foundation of Quayside's green stormwater infrastructure (see Page 210 for more).



Drivers could be guided to curb space managed by pricing and signage.

This design would double the cycling capacity of the Martin Goodman Trail.



The reclaimed road space would be repurposed for the public realm, creating a lively, linear park, with the potential to carve out spaces for playgrounds, markets, and public events.

Self-driving vehicles would improve street safety and require fewer traffic lights.

Self-driving vehicles and the light rail could share a lane without impeding transit operations.

Self-driving vehicles could be assigned to spaces and navigate directly there.

Queens Quay 2035

The wide adoption of self-driving vehicles could enable a dramatic transformation to the street. Because self-driving vehicles can be programmed to travel in predictable lanes at predictable speeds, it is expected they would be able to share the light rail without slowing down transit service, eliminating the need for separate vehicle lanes. (Sidewalk Labs plans to thoroughly test and pilot the compatibility of self-driving vehicle operations in light rail lanes prior to implementation.)

2035

Designing a welcoming, lively boulevard in 2035

As travellers move along Queens Quay, they would experience a grand boulevard full of intimate moments and a series of digital and design innovations that make the street inviting to pedestrians and cyclists no matter the season.

Tree clusters and cover.

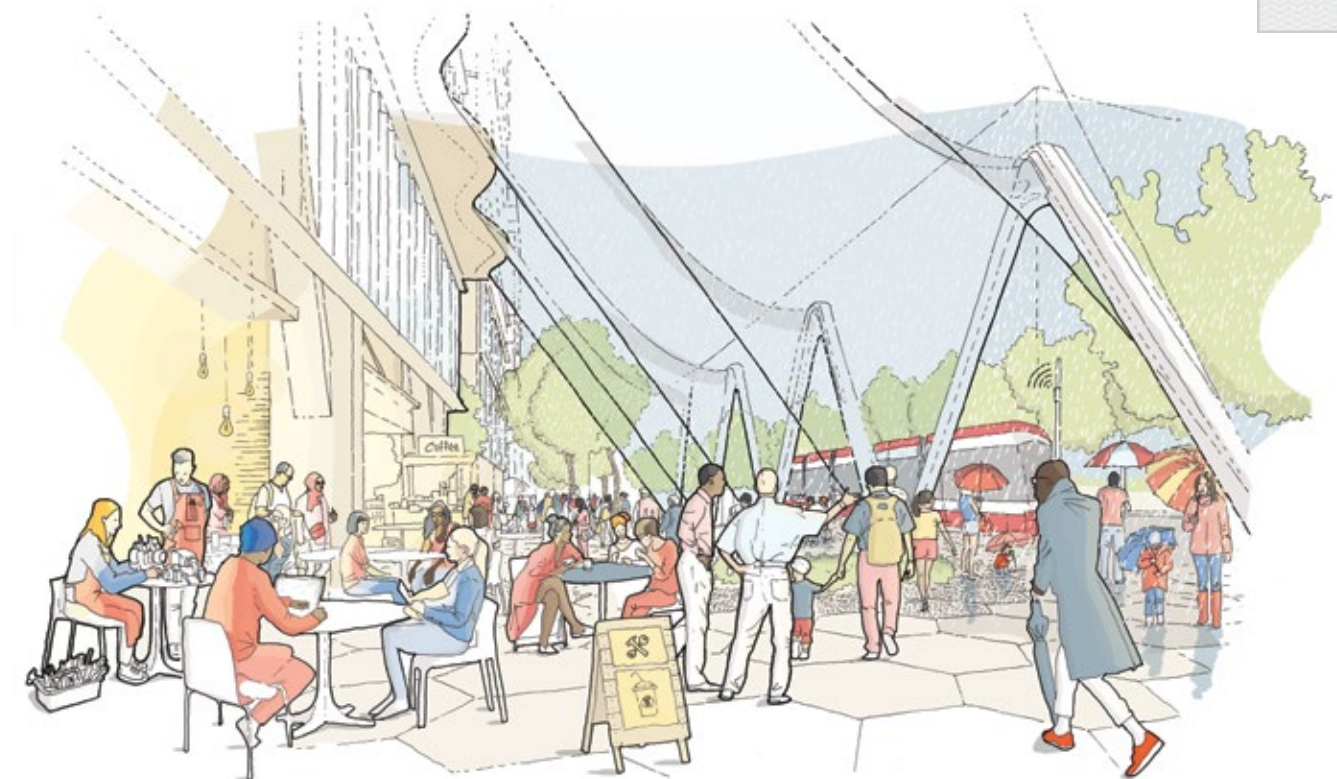
The rich tree canopy clustered at each end of Queens Quay would provide protection from winds sweeping in from the west and southwest, creating opportunities for pockets of playful, green space. All of these trees would have the 30-cubic-metre soil volume set out

in the Toronto Green Standard.⁴⁷ In addition to these ecological benefits, on Queens Quay East in 2025, it would be possible to plant trees at a concentration of 59 trees per hectare, a 20 percent increase over the concentration of 49 trees per hectare achieved on Queens Quay West today.⁴⁸



Building Raincoats.

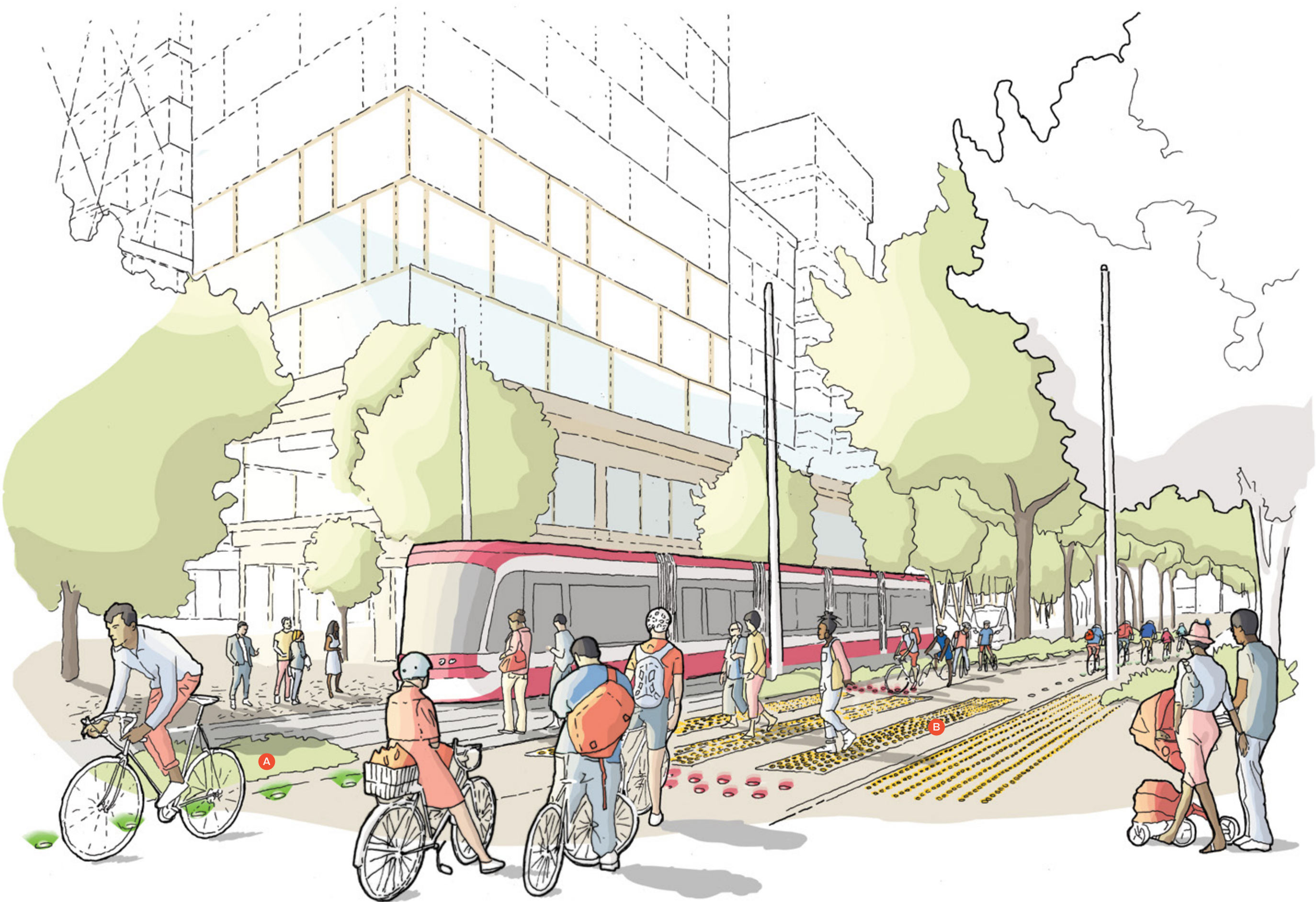
These covered, versatile spaces can protect pedestrians and shelter outdoor pop-ups or patio areas from rain and wind.



Wider public realm.

Flexible ground-floor spaces can be opened in summer, creating a seamless, indoor-outdoor experience for wide-ranging uses, such as markets, cafés, and arts spaces.





A Green wave.
LED lights embedded in the Martin Goodman Trail can turn green, signalling a green wave that allows cyclists to travel as fast as 22 km/h without stopping at intersections. Green waves encourage cyclists to ride in packs, increasing safety as they receive protected green lights at intersections.⁴⁹

B Real-time crosswalks.
In a traditional design, wide boulevards require traffic lights to allocate a long time for pedestrians to cross the entire street, potentially delaying the light rail. On Queens Quay, lighting embedded in crosswalk pavers at key intersections would create a two-stage crossing, guiding pedestrians safely to a central median and holding them if the streetcar is approaching.

Creating a more balanced, responsive streetscape

All streets in Quayside — even the smaller ones, such as Bonnycastle Street, shown here — would feature a range of innovations that balance the needs of all users and make adjustments in real time, facilitating easier, safer, more enjoyable trips.

Streets are used in dramatically different ways across the course of a day, a week, and even the seasons. But their designs are generally unable to adjust

to changing needs. For instance, pick-up and drop-up spaces might be packed during commuting rush hours but empty in the afternoon. Individual needs also vary: a healthy young adult typically needs less time to cross the street than a family with a toddler.

Quayside’s street designs can support a range of needs at different times. A coordinated mobility management system would provide vehicles with

real-time information on available passenger loading zones. Adaptive traffic signals can balance safety and convenience for all users. Adjustable lighting, protection from bad weather, and more public space would make for a more inviting streetscape.

A Street lighting.
In contrast to conventional street lights, which have only one brightness level, Quayside’s street lights would adjust to real-time conditions, helping to maintain a consistently safe, beautiful, and sustainable streetscape across all times of day and seasons.

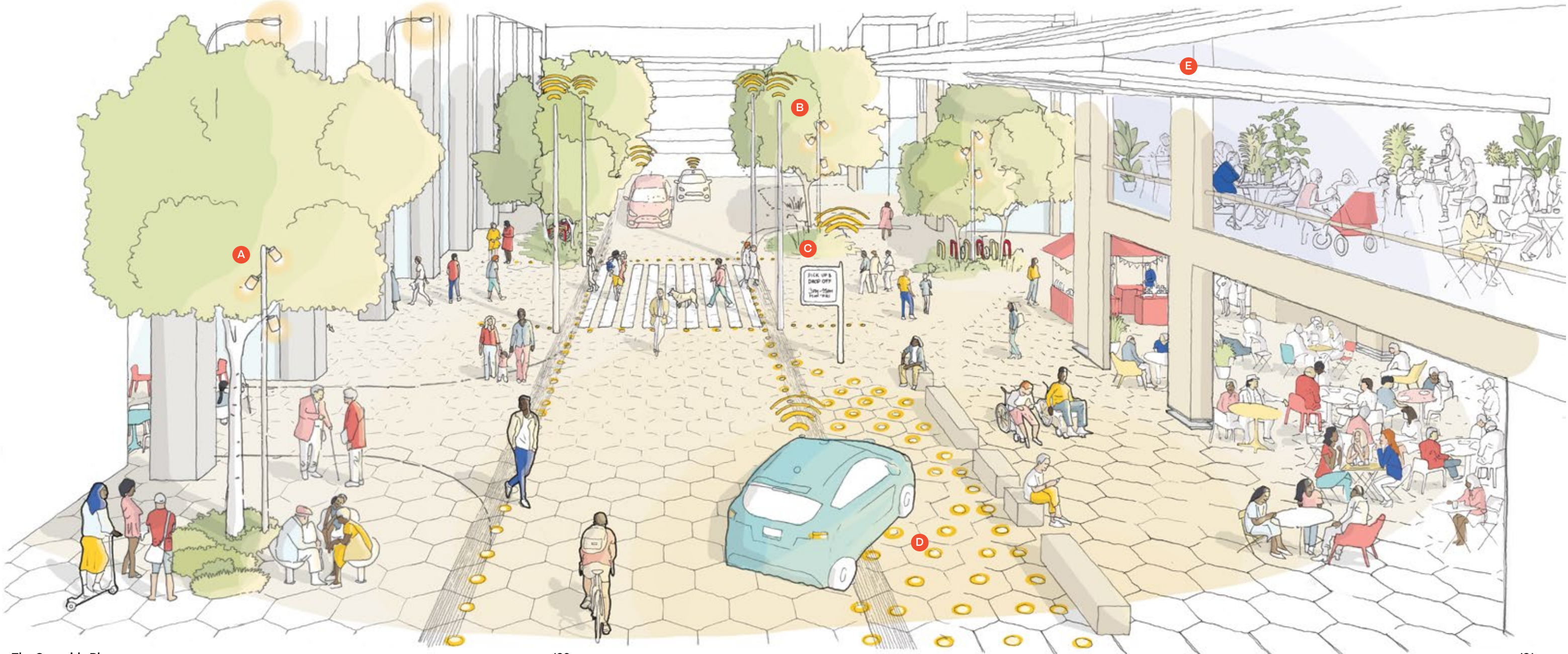
B Adaptive traffic signals.
Adaptive signals can make real-time adjustments to balance the needs of different groups, whether that means helping a slower pedestrian safely finish crossing or giving priority to a streetcar that is running late.

C Traffic coordination.
A proposed mobility management system would monitor space availability in underground parking areas and pick-up and drop-off zones throughout the neighbourhood, direct drivers (and, in the future, self-driving vehicles) to open spaces, and adjust the pricing in real time to encourage shared rides or alternative trip options.

D Dynamic curb.
Pick-up and drop-off spaces would expand or shrink based on demand. During weekday rush hours, the maximum dynamic curb space would be reserved for cars. At off-peak hours, excess spaces could be repurposed for programming like outdoor cafés or pop-up markets. These changes would be fully compliant with the Accessibility for Ontarians

with Disabilities Act (AODA), using a combination of tactile markings in pavers, movable street furniture, lighting, and digital signage.

E Retractable facades.
Facades that fold up similar to a simple garage door — one of several outdoor comfort tools in Quayside — would open during the summer months but close during rain and snow storms.



Bonnycastle Street

Using modular pavers to build a more durable and flexible street

Quayside's proposed modular pavement system would incorporate technology to make the streetscape more responsive and green, reducing the time and disruption required for utility work.

Traditional paving systems lead to rigid streets that cannot adapt when problems arise, technology evolves, or community needs change. Cracks are common — Toronto fixed 214,253 potholes in 2017 alone⁵⁰ — as are street cuts for utility work, leading to full crews working with noisy equipment for days. The result is a network of pockmarked pavement that is difficult and costly to replace. Opening up the street is a cost-intensive endeavour that discourages rapid innovation and

investment in new infrastructure, such as fibre-optic cables that have become a basic need for homes and businesses.

To address these challenges, Sidewalk Labs plans to deploy a modular pavement solution in Quayside. Sidewalk Labs has prototyped a pre-cast concrete, one-metre hexagonal road-grade paver that can be used from building-front to building-front and plans to work with local universities and regulators to refine the prototype and develop a pavement that would work in a Toronto context.

While modular pavement can cost the same to deploy as Toronto's current waterfront streetscape, it can be more cost-efficient over the long term due to a greater ability to resist wear and tear and to savings associated with the ease of utility access. The pavers can also host other technologies, and Sidewalk Labs plans to include features like heating to melt snow, lighting to animate street use, and permeability to allow for rain-water infiltration — making streets more safe, inviting, and sustainable.

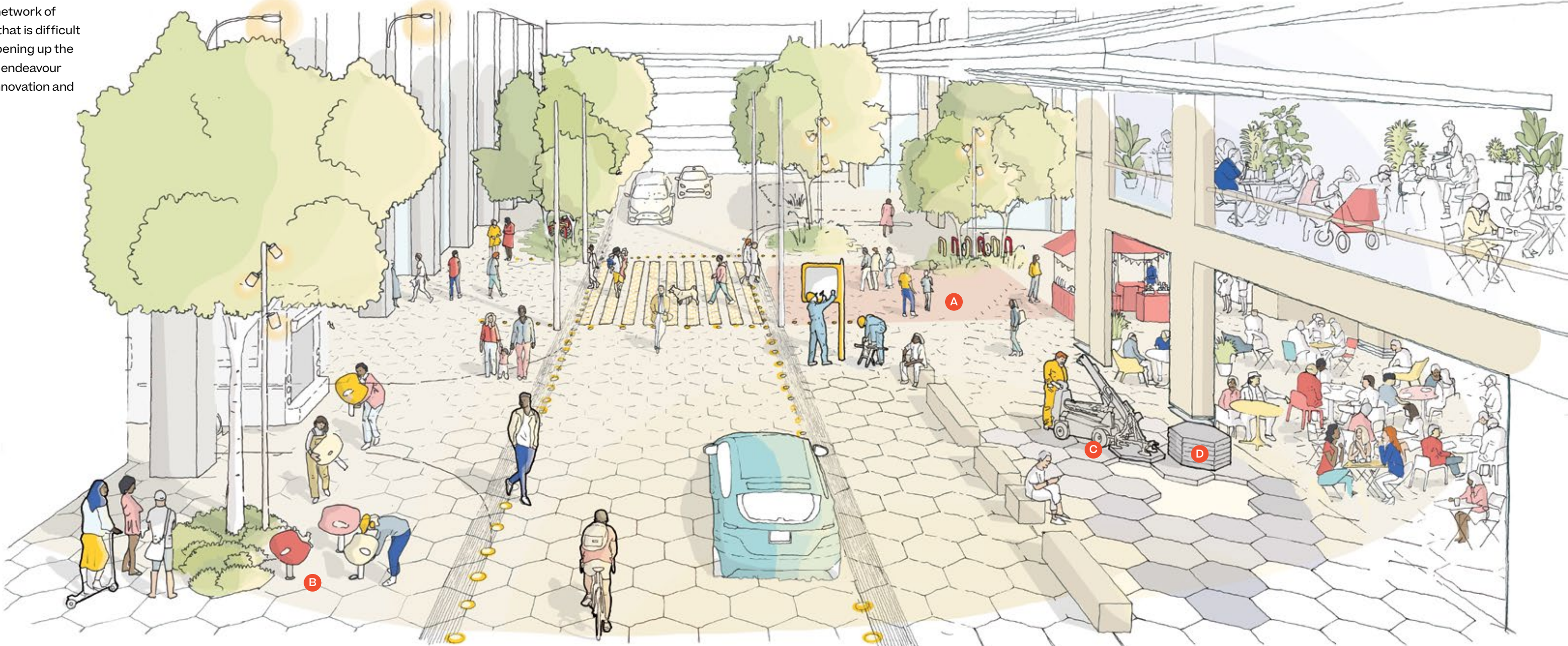
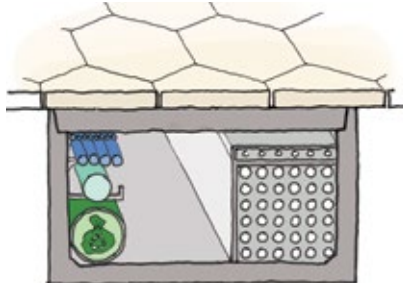
A Heating.
A number of modular pavers in Quay-side will pilot heating capabilities to clear snow and ice, improving safety and eliminating the need for salting.

B Streetscape installations.
Pavers would be designed to enable easy installation and removal of street infrastructure, such as signs, traffic lights, and equipment for special events.

C Paver maintenance.
Minor repairs can be completed in a single afternoon — down from Toronto's current average of several days — with a hand-held tool, reducing cost and neighbourhood disruption from jackhammers and large trucks.

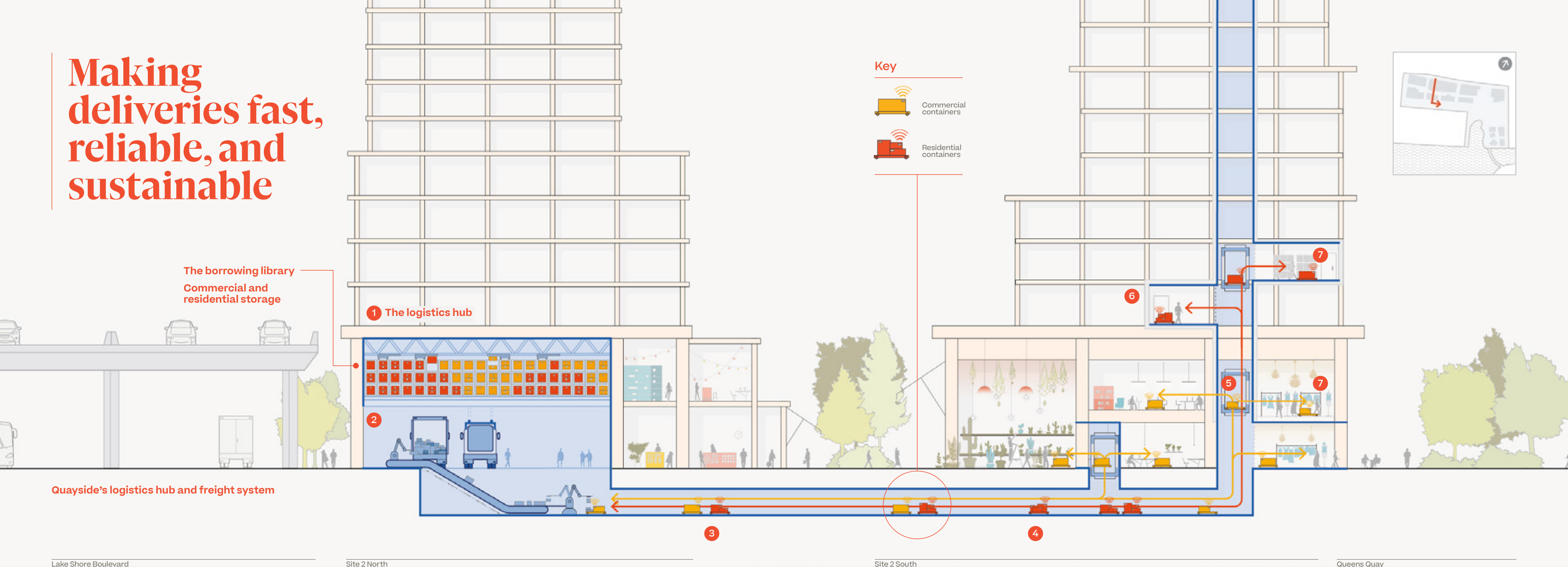
D Hexagonal design.
Each paver's 120-degree angles dis-tribute vehicle weight more evenly than traditional rectangles, helping to minimize cracks and potholes.

Open access channel.
Site utilities (such as fibre-optic cables, pneumatic waste tubes, and electric utilities) would be located in an open access channel running under removable pavers, speeding up maintenance and lowering the installation cost for new utilities by almost 90 percent,⁵¹ helping the neighbourhood keep up with future infrastructure innovations.



Bonnycastle Street

Making deliveries fast, reliable, and sustainable



Quayside's innovative last-mile delivery system would use underground freight tunnels to deliver packages directly to buildings, significantly reducing truck traffic from local streets.

Quick and reliable deliveries are essential to urban living, especially for residents who do not own cars. But the economic and environmental costs of such service is high: trucks clog the streets and contribute disproportionately to air and noise pollution in part of what is known as the “last-mile” delivery problem.

In Quayside, Sidewalk Labs proposes an innovative approach that would consolidate deliveries at a logistics hub, transferring them into “smart containers” that can be packed onto self-driving delivery dollies, which would reach residents and businesses through a system of underground tunnels. This system would reduce the number of on-site truck trips at Quayside by as much as 72 percent compared to business as usual.⁵²

The logistics hub would be a centralized mailroom and storage facility accepting deliveries from existing carriers, such as Canada Post or private couriers.

1 Logistics hub.
Sites 1 and 2 in Quayside are being planned with the potential to house a logistics hub that would include a centre for mail and parcel delivery, resident and commercial storage space, a borrowing library for items too bulky to keep in apartments (such as ladders), and a waste transfer facility.

The proposed logistics hub could handle 95 percent of Quayside's freight (projected at more than 18,000 daily parcels), significantly reducing truck traffic on internal streets.

2 Freight transfer.
Freight would be transferred into secure, stackable smart containers loaded onto self-driving delivery dollies.

3 Smart containers.
New smart containers are designed to know their destination, be tracked by app, and be accessed only by a unique passcode.

4 Robot tunnel delivery.
Self-driving delivery dollies carrying smart containers would travel through two bi-directional tunnels — each about two metres wide — connecting into the basements of Quayside's buildings.

5 Drop-off and pick-up.
Self-driving delivery dollies could take a building's freight elevator to a mailroom to drop off packages. They could return with new cargo, such as outbound cardboard, reducing empty runs.

6 Door delivery service.
Door delivery service would be available for bulkier packages, storage, or borrowed items, or for residents with special needs.

7 Resident and commercial storage.
Smart containers can be used for short-term storage in a resident's building and long-term storage (such as for seasonal items) at the logistics hub. Commercial storage would also be available at the logistics hub, enabling retail stores to act more like showrooms and helping small local businesses compete with more established enterprises. Users can track their deliveries, unlock containers, and save an inventory of stored goods through an app.



Planning for accessibility from the start

A series of workshops — conducted in collaboration with the accessible community in Toronto — led to 22 accessibility principles to guide planning in Quayside. These pages help bring some of these principles to life and outline some core accessibility commitments.

In 1945, some of the first curb cuts were introduced in Kalamazoo, Michigan. The idea was to make it easier for people using wheelchairs and other mobility devices to cross the street.⁵³

It took 50 more years and the tireless efforts of disability rights groups before the first legislation was passed requiring curb cuts on all street corners in the U.S.⁵⁴ But as cities began installing curb cuts, they noticed that the majority of people using them were not people using wheelchairs. They were parents pushing strollers, travellers wheeling roller bags, bicyclists crossing streets, even pedestrians who simply preferred a gradual slope. A simple technology designed and advocated for by people with lived experience of disability ended up benefitting a much wider group.

As the curb cut example shows, everyone benefits when neighbourhoods are designed with homes, transportation systems, and city services that can adapt to

all types of different abilities. In Quayside, Sidewalk Labs has a unique opportunity to design more inclusive environments from the start, with a chance to put into place accessible systems that can improve the lives of everyone and become a model for the world to follow.

To guide this planning process, Sidewalk Labs engaged extensively with the accessible community in Toronto, including professional designers, advocates, and especially people who self-identified as having lived experience of disability. Together, this group co-created 22 accessibility principles that Sidewalk Labs commits to following for the Sidewalk Toronto project.

Building on top of the legal standards set forth in the Accessibility for Ontarians with Disabilities Act, these principles served as a planning guide for both the accessibility of the physical elements of the neighbourhood and the digital services proposed for Quayside.



The 22 accessibility principles guiding planning in Quayside

General accessibility principles

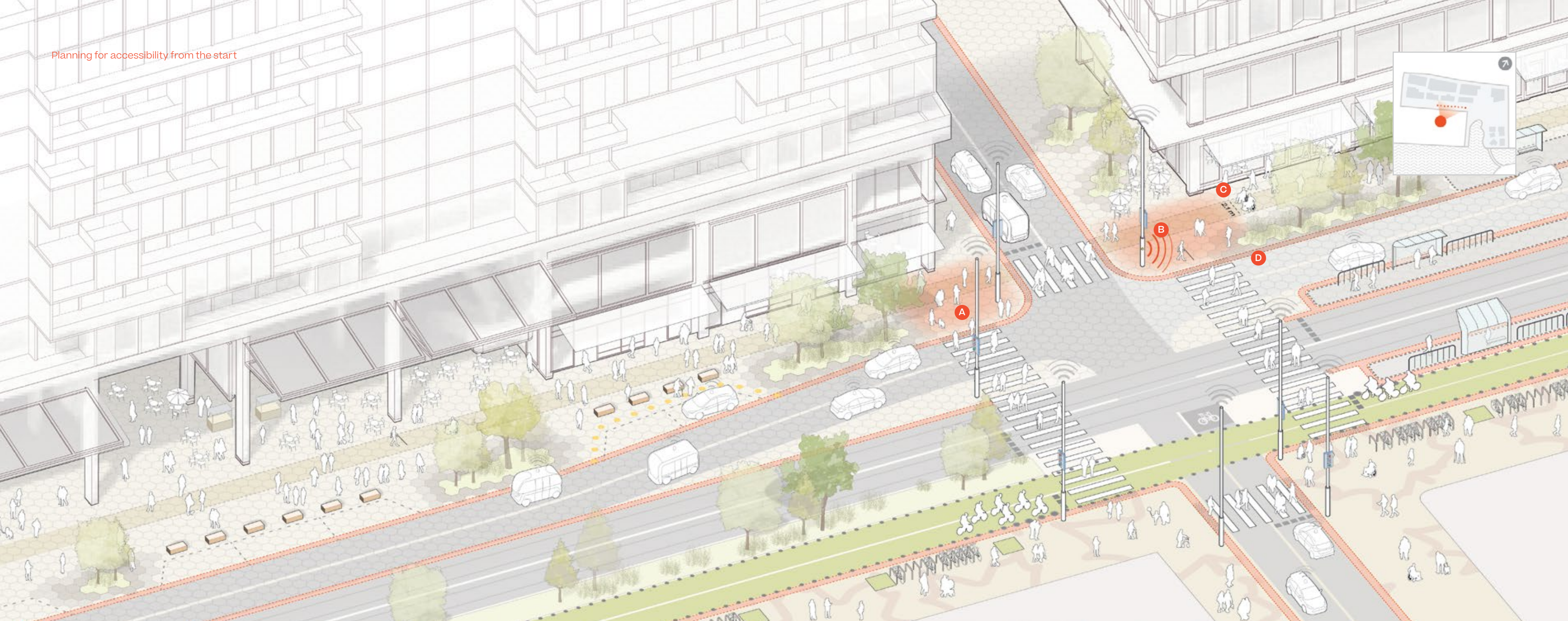
- | | |
|---|---|
| 1 Enable experiences that were not possible before | 5 Futureproof by default |
| 2 Do “nothing about us without us” | 6 Make the accessible path the most convenient, delightful path |
| 3 Make infrastructure simple, durable, and reliable | 7 Prioritize end-to-end accessibility |
| 4 Design predictable, intuitive experiences | 8 Prioritize autonomy first |

Physical accessibility principles

- | | |
|--|--|
| 9 Build for wheels | 13 Enable personal assistive technology, with a focus on easy to access, low-cost technologies |
| 10 Enable wayfinding in multiple formats | 14 Go beyond legal requirements |
| 11 Eliminate barriers and friction | 15 Enable flexibility and customization |
| 12 Promote relaxation and recovery | |

Digital accessibility principles

- | | |
|---|---|
| 16 Provide information in multiple, easily accessible formats and languages | 20 Use common standards for messages in audio wayfinding features |
| 17 Support multiple input modalities to all digital experiences | 21 Provide a recommended, free option that is also open to third-party alternatives wherever technology is necessary to interact with a key service |
| 18 Preserve privacy and support fairness in machine learning | 22 Use the best digital accessibility standards available and set new, higher standards wherever possible |
| 19 Allow an easy way to give feedback on digital tools | |



Dynamic, accessible streets

One of the cornerstones of an accessible city is the ability to travel independently and safely at street level. Sidewalk Labs proposes streets that are for pedestrians first — including pedestrians using mobility devices, travelling with service animals, and with varying levels of sensory perception and attention.

This proposal illustrates the following principles:

- **Build** for wheels
- **Enable** visual, auditory, and tactile wayfinding
- **Eliminate** barriers and friction

A Modular heated pavement.

Sidewalk and road maintenance can be a common impediment to accessibility. The Quayside plan features modular pavers that can be individually and quickly replaced if one cracks or breaks. Pavers at key street crossings and intersections would also include heating elements that can prevent buildup of snow and ice on pedestrian thoroughways. Heated pavers, coupled with building awnings that protect from rain and snow, would create pathways along Queens Quay and the pedestrian passage between Sites 1, 2, and 3, making streets more passable to people using wheeled mobility devices and more comfortable for service animals year-round.

B Wayfinding beacons.

Beacons are small objects, about the size of Post-it Notes, that emit signals that can be picked up by smartphones or other Bluetooth-enabled devices. Beacons can broadcast navigational information about the environment that is especially useful to people who are blind or partially sighted — for example, that an accessible ramp is located to the right of the steps. In Quayside, beacons would enable the use of BlindSquare and other wayfinding apps as part of the default street-level experience.

C Sidewalk width.

All thoroughfares in Quayside are planned to have at least enough room for two people using mobility devices (wheelchairs, scooters, white canes) to ride or travel side by side in each direction or for two people to sign while walking. Even more room would be provided wherever possible.

D Curbless streets.

In Quayside, instead of a vertical step separating the vehicle right-of-way from pedestrian paths, tactile indicators would indicate the line between pedestrian-only areas and spaces shared between pedestrians, bikes, and low-speed vehicles.

Accessible self-driving rides

One of the key experiences that participants in co-design sessions were most excited about was an accessible fleet of self-driving vehicles to help people get around the neighbourhood safely and independently.

Ideas included the ability to hail a self-driving vehicle using a voice assistant or soft-touch button according to personal preference, as well as visual or audio cues that could guide people to their vehicles (imagine an augmented-reality thick green line on the ground to follow, paired with a unique audio identifier for a vehicle).

The potential for self-driving vehicles to expand mobility and become part of a personal support network speaks to the essence of what accessibility is all about: making people feel at home in their city.

Sidewalk Labs commits to working with self-driving vehicle fleets to make calling, riding, and getting picked up and

dropped off easy and accessible. All streets — even pedestrian laneways — would be designed to allow accessible self-driving vehicles.

This proposal illustrates the following principles:

- Enable experiences that were not possible before
- Prioritize autonomy first

Seamless building thresholds

Getting through a door with an armful of packages can be difficult for anyone — and harder still for people who are using a wheelchair, partially sighted, or experiencing reduced dexterity. A session co-hosted with the Inclusive Design Research Centre focused on improving these “threshold” moments: transitioning through a door into a home, between floors in an office building, or past a badged access point.

The difficulty of these threshold moments can be eased or eliminated by applying simple technologies, like automatic doors. Where access control is necessary, doors can have a contactless scanner for a card, fob, or phone. Participants in the co-design session highlighted these as useful innovations, particularly when they are all knit together, such that a single access device can open doors, call elevators, negotiate access controls, and request street crossings.

Visual, audio, and digital cues can help guide passengers to their self-driving vehicles.



Sidewalk Labs commits to a design principle that “fewer doors are better.” When doors are necessary, designs should preference sliding automatic doors over button-controlled doors.

This proposal illustrates the following principles:

- Eliminate barriers and friction
- Design predictable, intuitive experiences

Infrastructure that reports back

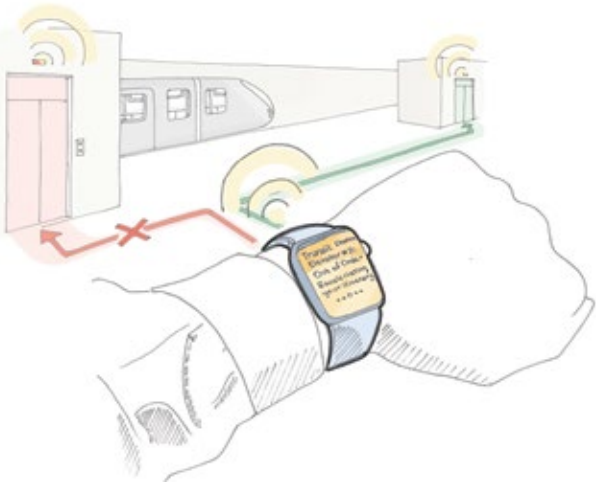
What causes a frustrating delay for some commuters can create an arduous ordeal for others — the wheelchair user faced with a broken elevator at her transit station; the youth with cognitive disabilities whose bus route unexpectedly changes; the visually impaired senior whose daily walk is interrupted by road work.

But imagine if people could be alerted immediately when station infrastructure breaks down, when transit service gets delayed or detoured, or when street maintenance occurs — and be instantly re-routed via a smartphone or wearable device. Participants at a Sidewalk Labs accessibility hackathon prototyped just such a technology, which would allow visually impaired pedestrians using the BlindSquare app to be safely guided around construction sites.

Sidewalk Labs commits to developing infrastructure capable of reporting itself as broken and to working with existing navigation tools to ensure every journey in Quayside is accessible, safe, and convenient for all.



Digital technology can provide safe and secure building entry without push buttons or fob keys.



Wearable tech can provide wayfinding instructions and alert people to obstacles or delays.

This proposal illustrates the following principles:

- Make infrastructure simple, durable, and reliable
- Enable personal assistive tech

Engaging the accessibility community in Toronto

Sidewalk Labs co-developed 22 initial principles with more than 200 members of the accessibility community in Toronto and around the world. Throughout 2018, Sidewalk Labs hosted 14 events focused on accessibility, including more than 70 hours of co-design sessions.⁵⁵ After each event, Sidewalk Labs compiled attendee thoughts, ideas, and feedback; added it to the principles list; and presented the latest version at the next event for further feedback.

Sidewalk Labs sees these principles as a living document to be updated as new insights emerge through prototyping or user testing. Sidewalk Labs hopes to work with government agencies to harmonize these principles with existing legislation and codes and incorporate them into development plans at a more granular level. Sidewalk Labs will continue to listen, engage, and connect with organizations, advocacy groups, and individuals focused on accessibility and inclusive design in Toronto. And Sidewalk Labs will continue to be open to great new ideas for creating an accessible, flexible, and empowering neighbourhood.

Sidewalk Labs will continue its work with the local accessibility community to integrate accessible systems that can improve the lives of everyone and become a global model.

Exploring alternative designs for Quayside’s street network

Sidewalk Labs has explored multiple alternative designs to ensure sufficient road network connectivity while at the same time creating a significant new public space at Parliament Plaza.

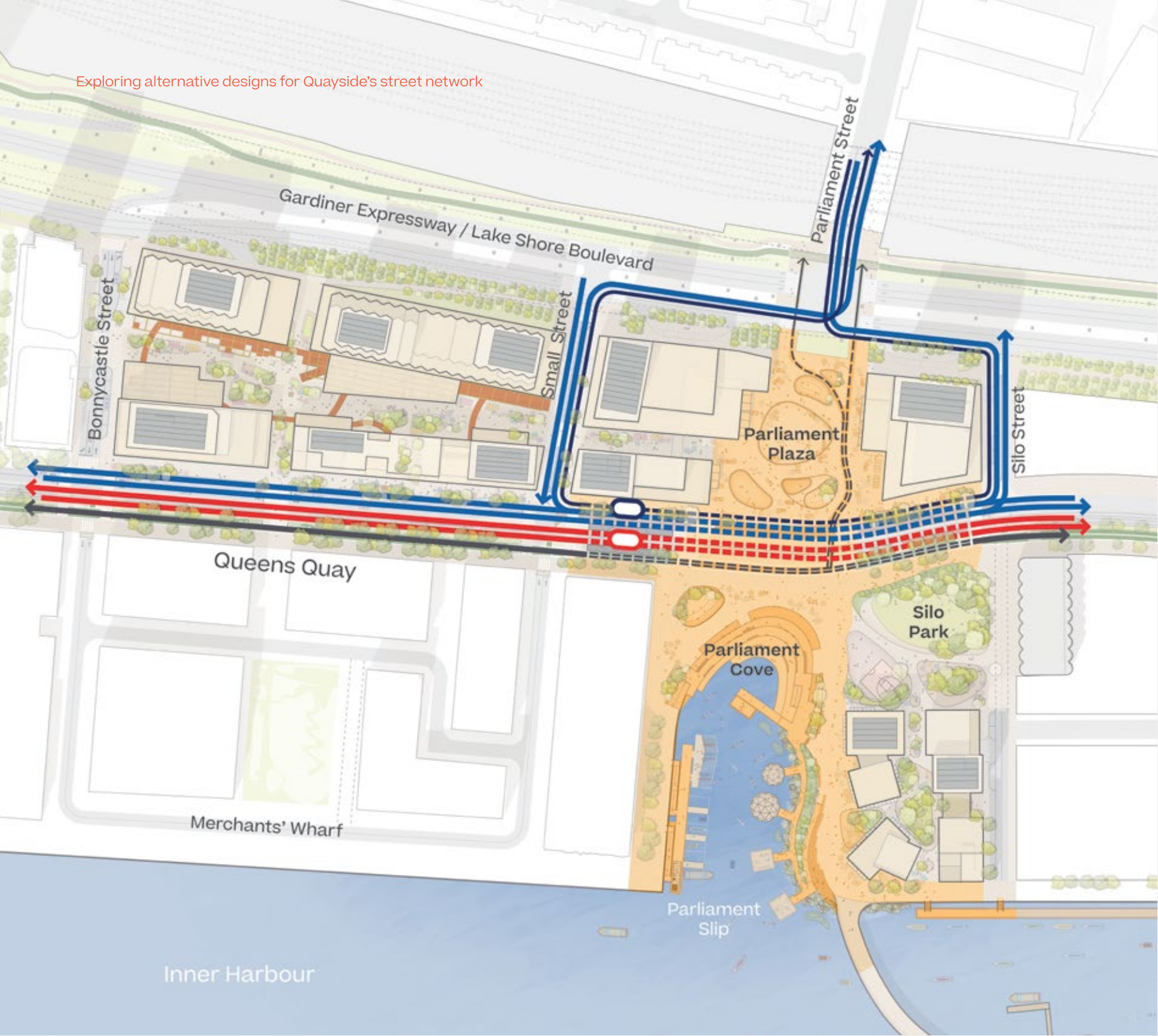
Working with Waterfront Toronto and the City of Toronto, Sidewalk Labs explored more than a dozen designs for a proposed new plaza in Quayside, at the base of Parliament Street, aiming to balance road network connectivity with the creation of a safe and vibrant public space. These alternative road network designs for Queens Quay considered many options: full vehicular access across both Queens Quay and Parliament, one-way streets, shared streets (building on Toronto precedents such as Willcocks Common), and a light-rail animated, fully car-free plaza. Alternative public realm designs were also explored, including options to retain and extend the head of the slip or partially fill the slip in varied patterns.

The proposed design retains Queens Quay as a two-way, east-west bound connection across a flat pedestrian Parliament Plaza, with Parliament Slip filled and a new head of the slip developed into a cove feature that brings visitors down to the water’s edge. Upon opening, Queens Quay between Small and Silo streets is proposed as a slow zone in which pedestrians have priority and all transportation modes move at reduced speeds.

This configuration allows for city buses (and other vehicles) to travel south on Parliament Street, make an easy loop through the Quayside site, and return northbound on Parliament Street. As mobility technologies evolve, the flexibility built into this section of Queens Quay would allow for the evolution of this stretch of Parliament Plaza.

The proposed option was selected because it represents the best balance between providing for east-west vehicular access to link waterfront neighbourhoods and maintain passage to the Port Lands, and the creation of an expansive and flexible public plaza. Filling in a portion of the slip and creating public space south of Queens Quay ensures connectivity between existing public spaces and facilities on the west side of the slip and the new outdoor public green space of Silo Park to the east of the slip.

The proposed design will be assessed by the city as part of the MIDP review and final approval will be subject to the regular public environmental assessment process.



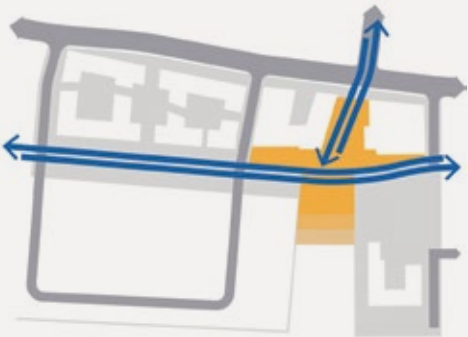
**Quayside
proposed design
Two-way Queens
Quay slow zone**

- Bus stop
- Bus route
- Vehicular circulation
- Light rail stop
- Light rail route
- Bicycle network
- Slow zone

Eight possible street designs

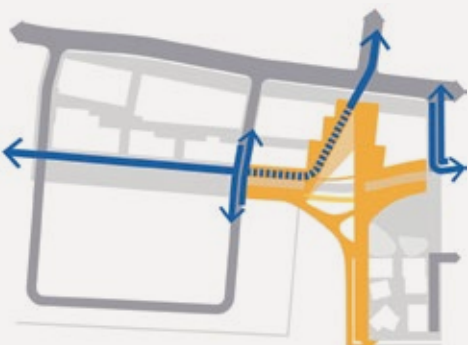
Precinct plan:
Two-way Parliament Street and two-way Queens Quay

Car-free plaza



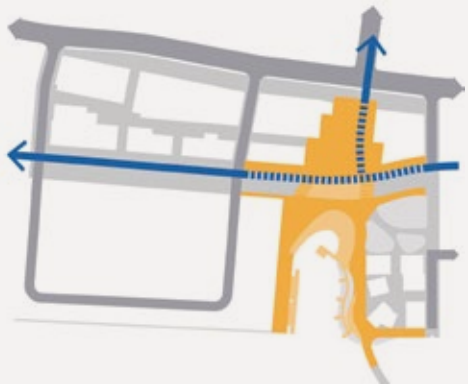
One-way northbound Parliament slow zone

One-way southbound Parliament Street



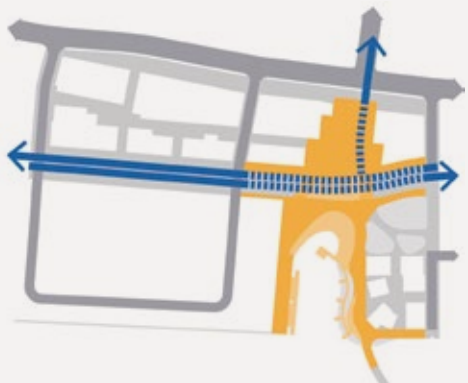
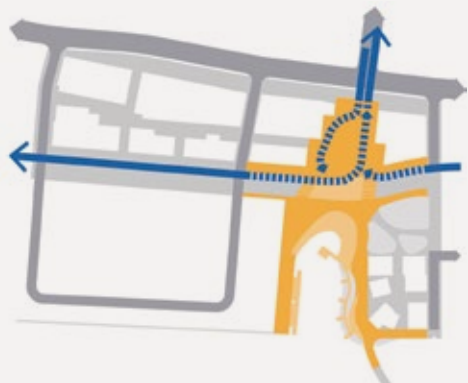
One-way westbound Queens Quay slow zone

One-way westbound Queens Quay slow zone and
one-way northbound Parliament slow zone

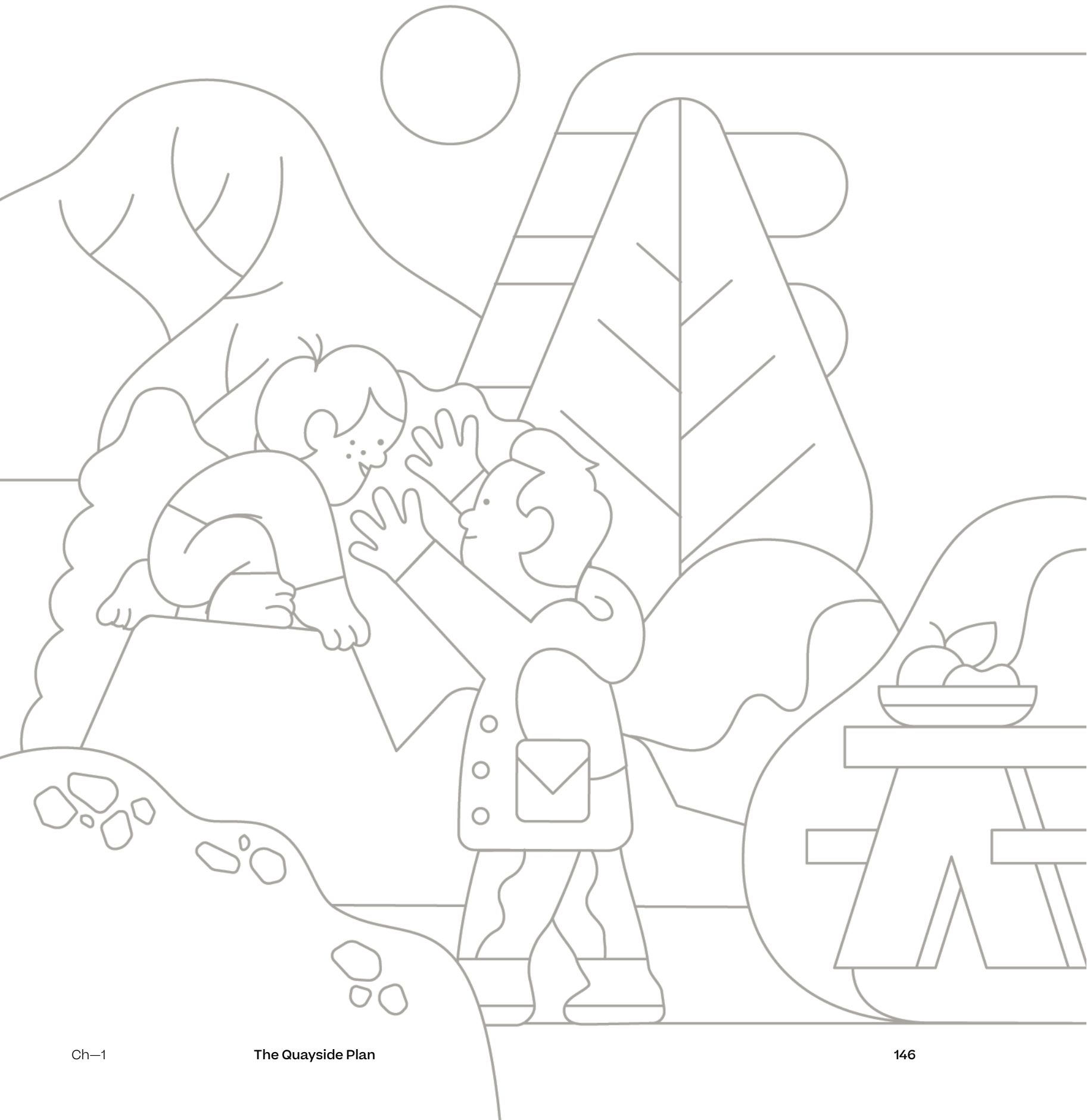


One-way inbound Queens Quay slow zone and
Parliament slow zone loop

Two-way Queens Quay slow zone and one-way
northbound Parliament slow zone



Public Realm



A system of streets, parks, plazas, and open spaces that encourages people to spend more time outdoors, together.



See the “Public Realm” chapter of Volume 2 for more details on the urban innovations described in this section.

Creating an expansive public realm network

The Quayside plan features an expansive public realm designed to bring together residents, workers, and visitors of all ages and abilities and to remove traditional barriers between indoors and outdoors, public space and private space, and land and water.

During the broader public engagement process, Torontonians shared many design priorities for the public realm in Quayside, including the need for accessible amenities, diverse programming, and connections to nature and water. To get further perspectives, Sidewalk Labs commissioned an ethnographic study of the experiences diverse Torontonians seek out in open spaces.

Across demographics, study participants shared six fundamental needs for open space, which Sidewalk Labs has incorporated into Quayside's public realm designs: convenience, discovery, gathering space, serenity, spectacle, and all-ages play. The following pages go into greater detail on how these spaces reflect the current needs voiced by Torontonians — while remaining adaptable to future ones.

This approach aims to create a truly connected public realm network that provides more space and is more usable more of the time.

A truly connected public realm network

Quayside's public realm does not treat the neighbourhood in isolation, instead aiming to create a network carefully stitched together with surrounding areas. This approach means designing in concert with the neighbourhood to the west of Quayside, Bayside;⁵⁶ with future improvements to the public realm under the Gardiner Expressway; and with public spaces to the north of Quayside, in particular in the Distillery District and St. Lawrence neighbourhood. In addition, this approach builds on the innovations established along the Central Waterfront to date. Together these efforts strive to create an experience around a slip unlike any other in Toronto, with a remarkable sense of arrival from the north, direct access to the lake, and a diverse blend of indoor and outdoor uses for all seasons.



Quayside's public realm

- 1 Parliament Plaza
- 2 Silo Park
- 3 Parliament Cove and Slip

New community spaces connected to Lake Ontario

The heart of the public realm in Quayside is the Parliament Plaza, Cove, and Slip area, which brings together a series of public spaces between Lake Shore Boulevard and Lake Ontario, from Small Street to Silo Street.

Each space has a unique character and programming potential. Parliament Plaza itself is a flexible space well-suited for markets, public art installations, all-ages play, and events that integrate with surrounding buildings — all made possible by the closure of Parliament Street to vehicles. This emphasis on arts and culture builds on the precinct plans that envisioned a sculpture garden adjacent to Parliament Street.

The plaza design is complemented by recreational and social infrastructure uses to the south, including the Bayside Community Centre, the greenery of Silo Park, and a school amid the collection of Site 5 buildings near the lake's edge. These areas are directly connected with Parliament Cove, allowing for seamless pedestrian movements between the community centre and Silo Park as well as direct access to the water for marine or cultural uses (such as an amphitheatre that encircles a floating stage).

The western side of Parliament Slip remains a reinforced dock wall and provides easy access to marine transit; the eastern side has floating structures for additional water-based programming. A floating walkway also begins on the eastern side of the new bridge, establishing expanded space for ecologies and water uses up through the Keating Channel.

Drawing people outdoors at Parliament Plaza



The proposed 6,000-square-metre Parliament Plaza would provide a stirring entrance to a reimagined waterfront, drawing people through a vibrant open plaza towards Parliament Slip to experience the water in exhilarating new ways. Parliament Plaza

would fulfill the need for **spectacle**, through its innovative art installations, as well as the need for **convenience**, through the provision of food and goods from a bustling group of small vendors and shops lining the plaza's edge.

A Interactive water features.

Visitors entering Parliament Plaza from the north would be greeted by interactive water features the moment they cross Lake Shore Boulevard. The flexible plaza space is designed to transform from an active water play space into a site for art installations through a dramatic lighting system and technology that can manipulate the water into mirror-like stillness, fine mist, splash pad, or dry zone.

B Ground-floor activation.

The stoa surrounding Parliament Plaza would be filled with shops, pop-up booths, maker spaces, cultural installations, and other uses that can spill out onto the plaza, creating a lively market destination. These stoa spaces would be connected to a series of pedestrian pathways that begins at Yonge Street and runs parallel to Queens Quay, culminating at Parliament Plaza.

C Outdoor comfort systems.

Sidewalk Labs plans to deploy innovative weather-mitigation systems that would make outdoor spaces such as

Parliament Plaza comfortable for 35 percent more hours throughout the year, compared with conventional development.⁵⁷ The additional days for programming — which could support outdoor markets, movie festivals, art installations, and more — would create a more vibrant street life that also yields direct economic benefits. An overhead canopy would span the plaza, offering protection from wind, rain, and snow, as well as providing shade on sunny days. The canopy would be equipped with rigging and power mounts, enabling varied installations.

D Slow zone.

Parliament Plaza would feature a designated slow zone in which the light rail, vehicles, cyclists, and pedestrians all share space while travelling at low speeds (10 km/h). Modelled on shared plazas from Amsterdam (Dam Square) and Nice, France (Place Masséna), this zone would ensure connectivity across the site while still allowing for a safe, vibrant plaza.

Facilitating recreation for all ages at Silo Park



The proposed 5,000-square-metre Silo Park — framed by the Victory Soya Mills silos and sheltered by abundant trees — would be the green heart of Quayside. The park would be seamlessly connected by bridges to a community centre at Bayside,

creating a lively mix of indoor and outdoor recreational facilities. The Silo Park plans fulfill the need for gathering via bookable community spaces, as well as for all-ages play, through multi-generational recreational opportunities.

A All ages play-scape.

A play-scape would consist of such activities as children's nature play, adult-scale swings connected to sound and light, exercise equipment for all ages, skateboarding surfaces, and space for other active sports. This intergenerational design is intended to create public space that is inclusive for everyone.

B Multi-sport area.

A multi-sport recreation area would use lights embedded in the ground to reconfigure the field to accommodate a variety of interactive games, including basketball, ball hockey, tennis, pickleball, and futsal.

C Abundant tree canopy.

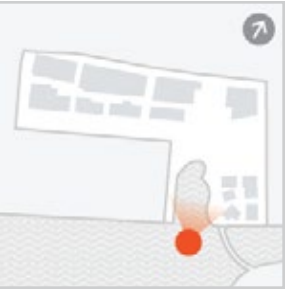
More than 430 trees would be planted throughout Quayside.⁵⁸ Silo Park would be densely planted with trees designed with a "forest patch" strategy that combines diverse species of tall trees with smaller bushes and plants to promote natural regeneration, adaptive resilience, and support for pollinators. Plant health would be monitored by a digital maintenance system capable of providing park officials with real-time alerts about landscaping and watering needs.

D Experimental Zone.

Sidewalk Labs is working with Toronto's Indigenous community to design and program an Experimental Zone, guided by principles around environmental history, cultural history, place and tradition, and respect for nature. Programming would change across the seasons: in colder weather, the area could host a design competition for local Indigenous artists to develop innovative structures for winter gatherings; in warmer weather, it could host student projects that use digital media to add a layer of cultural interpretation, storytelling, and learning into the landscape.

1
2
3

Connecting people to the water at Parliament Slip



Parliament Slip and a new Parliament Cove would provide direct access to the water for a range of activities. The promenade is designed as a place to walk and linger, encouraging people to picnic as the water laps onto the shores, gather around fire pits, or travel

across a new pedestrian bridge to visit the stunning new parklands of Villiers Island. Parliament Slip fulfills the need for serenity through its expansive view of Lake Ontario, as well as the need for discovery through water-based programming.

A Parliament Cove.

A set of floating wooden terraces would bring people directly down to the water and an intimate cove. A floating stage could enter this area, enabling water-borne performances. The shoreline to the east side of the slip would be naturalized, restoring aquatic habitat and supporting biodiversity.

B Floating walkway.

Along the promenade, on both the west and east sides of the slip, a floating walkway would bring people down to the water and curve around

the edges of the slip to provide direct access to the Inner Harbour. Comfortable seating, aquatic plantings, and stations for kayak rentals and water taxis would create opportunities for contemplation and active transportation on the water.

C Floating spaces.

Along the restored ecology of the Parliament Slip shoreline, a planned series of floating structures could provide space for artist workshops focused on the creative exploration of nature, technology, and urbanism, as well as opportunities for visitors

to picnic, sunbathe, or just gather and linger on the water. One structure would house an ecological research station, providing opportunities to conduct water-based research studies.

D Boardwalk bleacher.

At the southern edge of the slip, a six-tiered bleacher with seating for approximately 200 people would surround the dock wall, providing further opportunities for people to gather and connect with the lake.


Planning a dynamic arts and cultural landscape

Quayside’s signature neighbourhood spaces are designed with public art and creative culture at their core, providing expansive digital, physical, and programmatic infrastructure for ongoing creation, expression, and dialogue from diverse voices.

Art and creative culture are central to creating an inclusive and participatory public realm. Today, the thoughtful integration of emerging technologies into the urban environment offers new and engaging ways to further support community identity and social connections.⁵⁹ Despite public art’s immense potential, in many neighbourhoods it remains limited to static modern sculptures. The Quayside plan aims to shift this paradigm.

All public spaces in Quayside would have access to high-speed connectivity, power, mounts, projectors, speakers, lighting, water, and storage — the vital

ingredients to making emerging forms of participatory public art easy. This shared infrastructure would enable public art to flourish: from an Experimental Zone for Indigenous placemaking in Silo Park, to water-based performances in Parliament Cove, to workshops on floating structures in Parliament Slip, to projection mapping on building Raincoats along Queens Quay, to an arts hub with access to fabrication and prototyping tools, to the installations and performances in the underpasses, Parliament Plaza, and Parliament Cove illustrated on these pages.

In Quayside, a proposed new non-profit entity called the Open Space Alliance would have a robust programming budget to support ongoing community arts programs, design competitions, and residencies for local and international artists and technologists. 

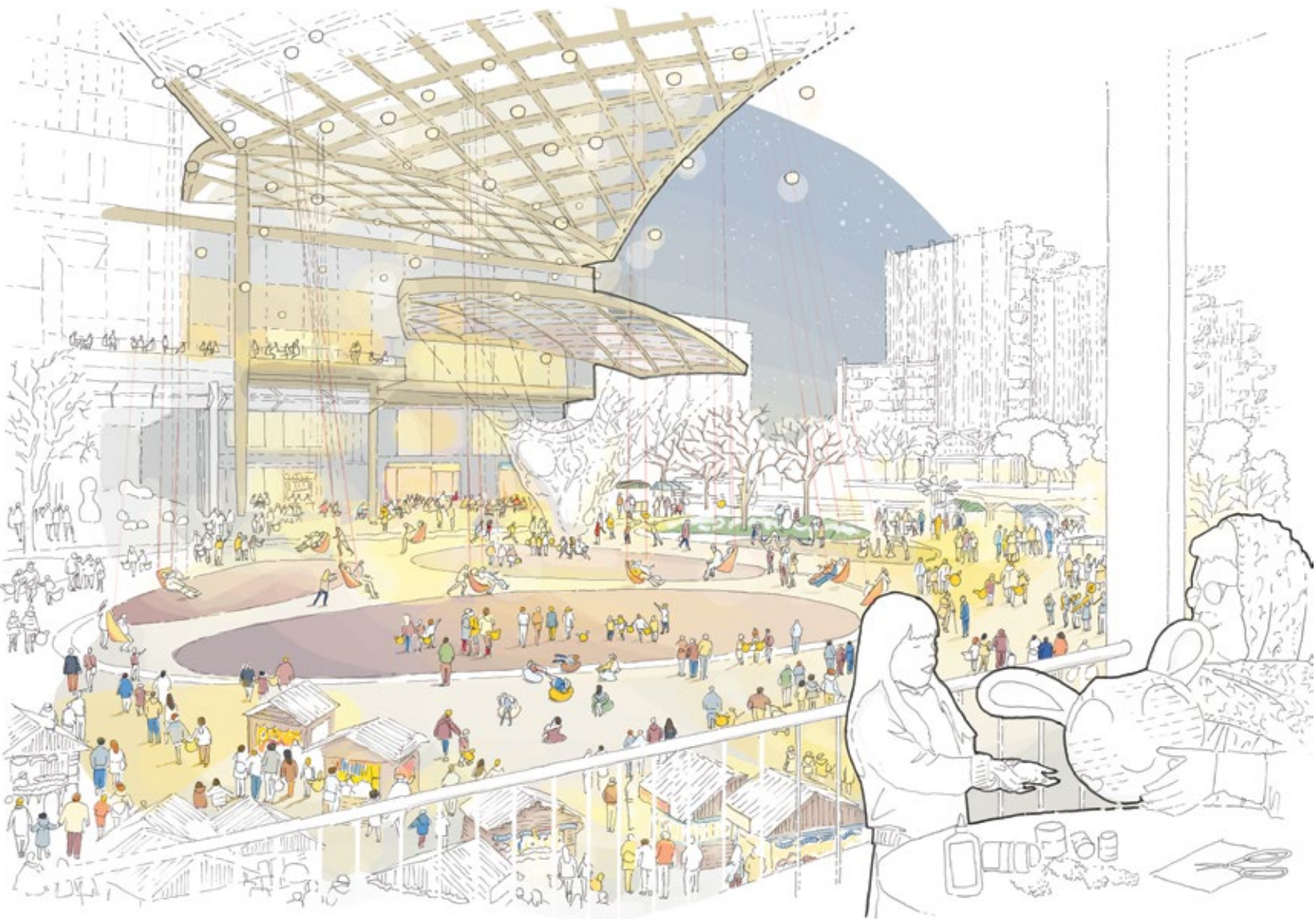
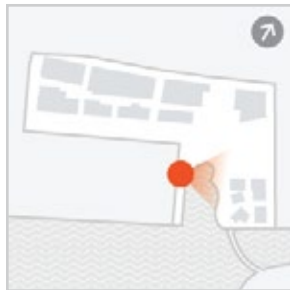


See the “IDEA District” chapter of Volume 3 for more details on the proposed Open Space Alliance.



Underpass installation.

The public art experience would begin in the underpasses on Parliament Street north of Lake Shore, where what currently is a damp, dark tunnel can become a multi-media installation of projection and sound that evokes the arrival on the waterfront.

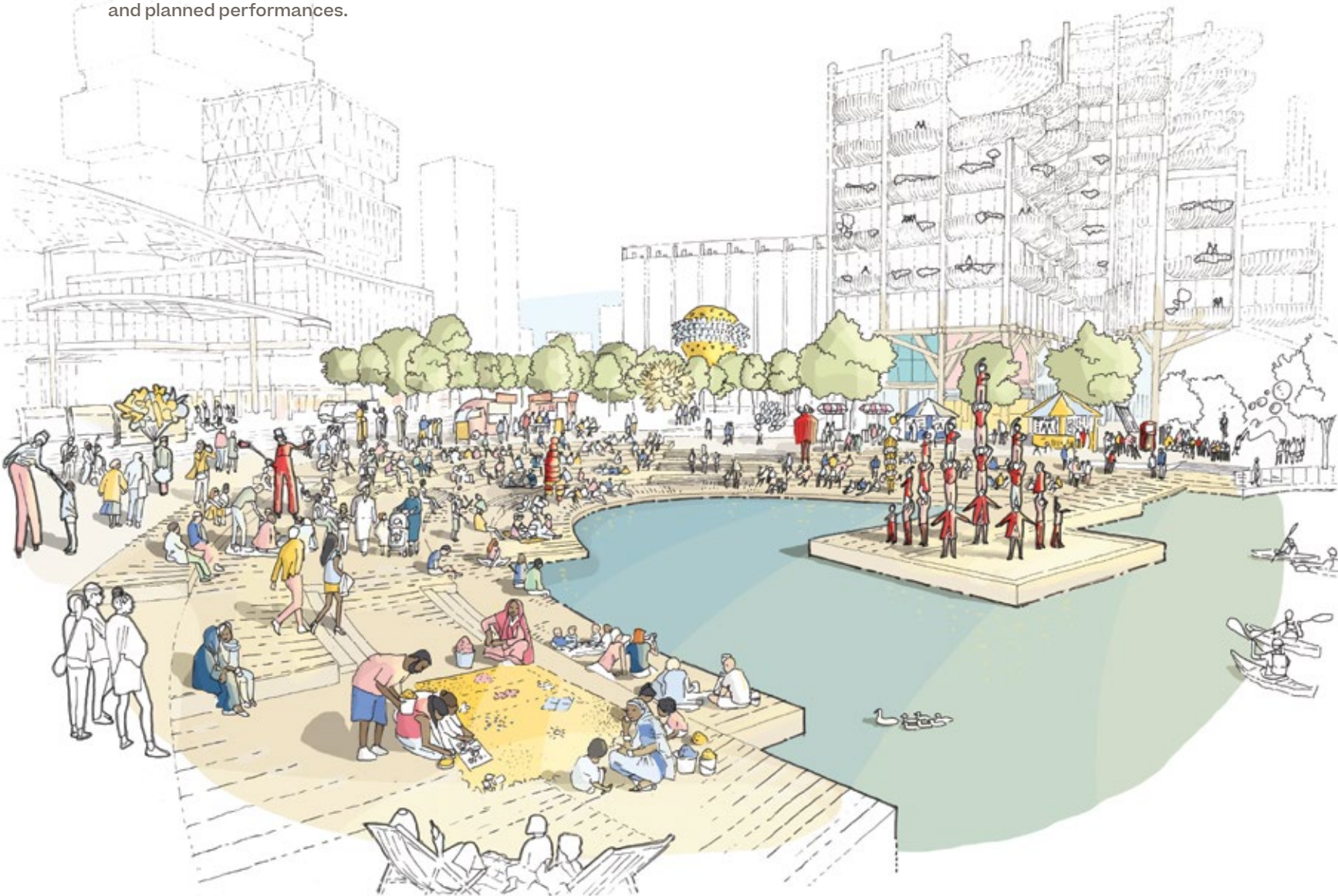


Parliament Plaza.

The planned centre for neighbourhood culture is Parliament Plaza, designed as a year-round open-air theatre where artists can create immersive, multi-sensory installations using flexible infrastructure. The ground can provide mist, the building facades can be opened or

closed, and a canopy can provide rigging to support the suspension of materials. Imagine a forest of large-scale swings hanging for all to enjoy, each swing triggering sounds recorded on Lake Ontario, harmonizing when people move together.

Parliament Cove.
An intimate amphitheatre would encircle Parliament Cove, with a barge providing opportunities for spontaneous and planned performances.



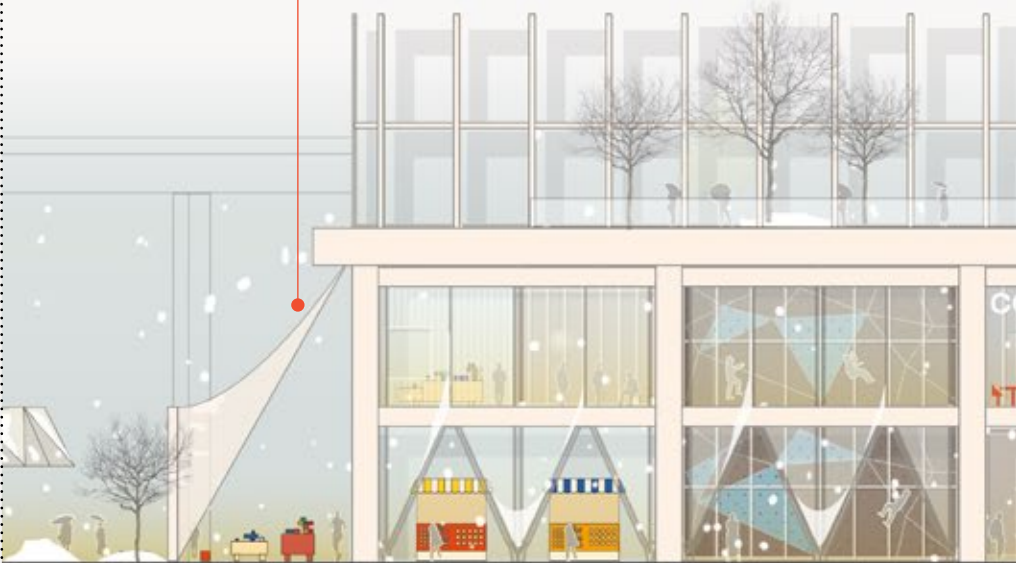
Reimagining ground floors as diverse, vibrant, adaptable spaces

The Quayside plan supports a variety of retail, office, production, and community spaces within its ground floors through flexible floor plates that connect directly to the street to create a larger, livelier public realm.

Summer



Retractable facades.
Some facades would include retractable glass door systems that can open easily to create a more seamless public realm.



Building Raincoats.
Buildings in Quayside would have Raincoats that can protect against rain, snow, wind, and sun.



Vibrant ground-floor spaces are key to a neighbourhood’s energy and convenience. But changing market forces — from online shopping to rising construction costs — and rigidly sized storefronts are limiting the variety of tenants who can survive. Toronto’s waterfront has started to address this challenge through its ground-floor animation agreements, and the Quayside plan aims to build on this progress by devoting the lower two floors to flexible stoa structures that promise a return to the bustling public markets of an earlier time.

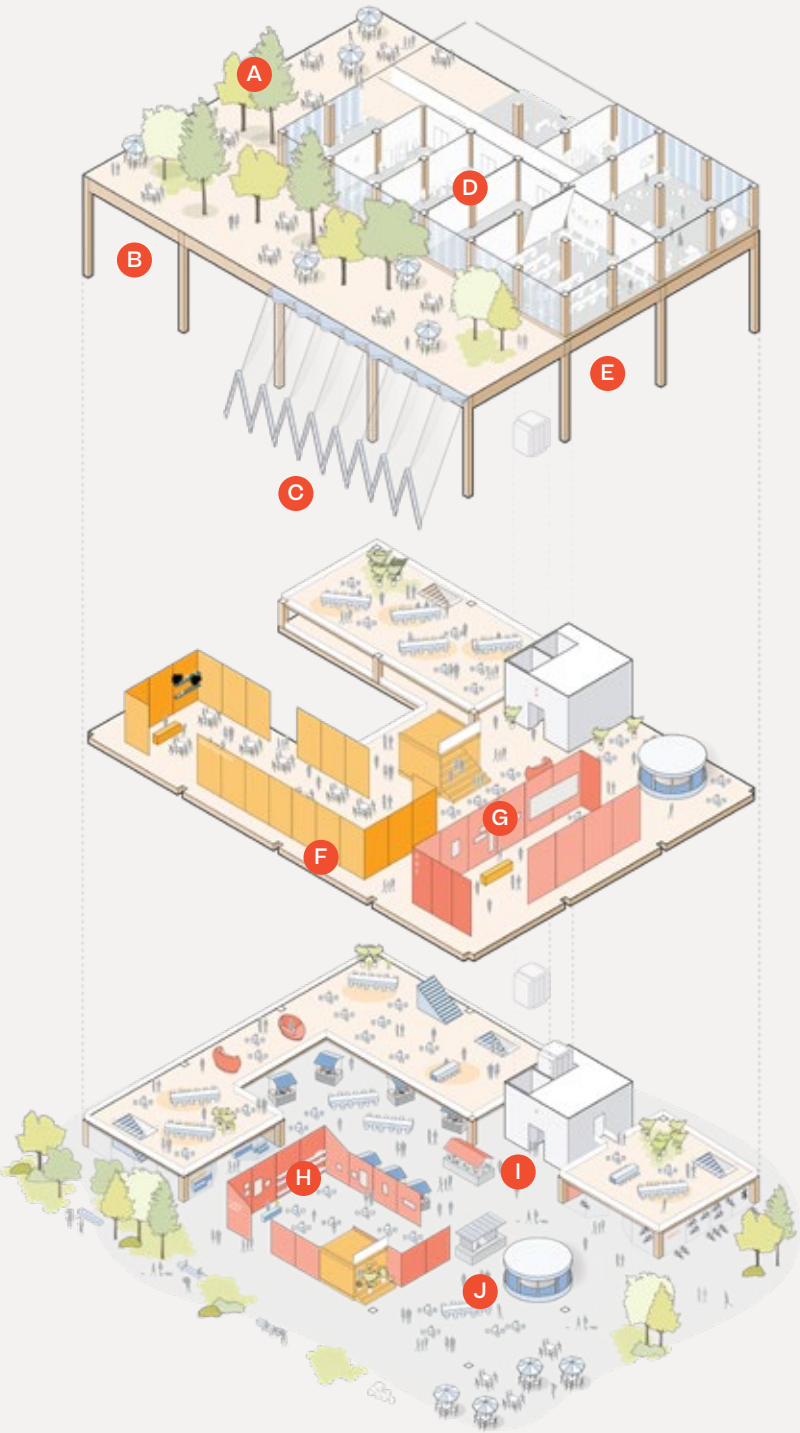
Stoa’s adaptable spaces and a digital leasing platform can support a broad mix of pop-ups, arts and cultural installations, community uses, small businesses, maker spaces, and markets, alongside established retail tenants.⁶⁰ Stoa is designed with the ability to open directly onto the street and be protected by innovative weather-mitigation strategies, creating seamless indoor-outdoor spaces that strengthen the neighbourhood’s sense of activity and community.



22°C – Fully conditioned stoa

Quayside stoa: Floors 1 and 2 and rooftop

- A Rooftop terraces
- B Spacious column bays 40-by-40 feet
- C Building Raincoats
- D Modular ceiling grid with lighting and AV plug-ins
- E Exposed timber beams and walls
- F Double-storey ceiling height six metres per floor
- G Deconstructable partitions 50% of walls
- H Utilities wired through flexible baseboards
- I Polished concrete floors
- J Movable kiosks



Providing a flexible shell for exploration.

For many businesses, a lack of customizable ground-floor spaces and high fit-out costs prevent them from adapting to a changing market — or opening at all. Stoa’s physical structure is designed to remove those barriers by creating adaptable spaces that can be reconfigured quickly and affordably.

A flexible floor configuration of deep column bays enables a marketplace thrumming with 100-square-foot stalls to coexist beside 6,500-square-foot anchor tenants that provide long-term neighbourhood stability. Interior walls are designed and wired for quick, low-cost transformations. With this design, Sidewalk Labs estimates that the costs associated with structural elements

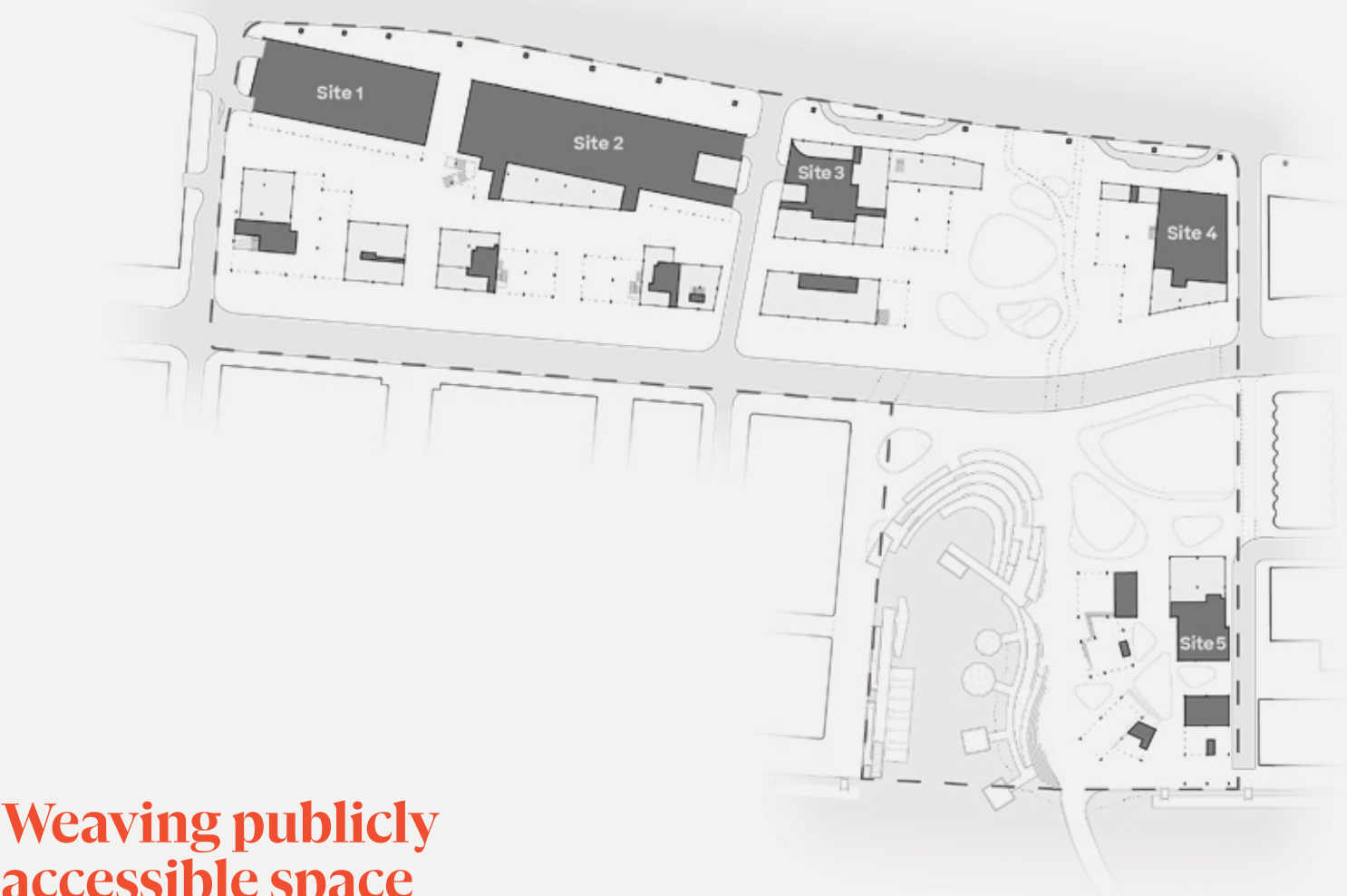
of renovation, like moving walls and electrical wiring, would decline by 50 percent.⁶¹ Open areas for public events, casual gathering spots, and community hubs could be threaded throughout stoa spaces.

The Quayside plan calls for stoa spaces in Sites 1 to 4 to exist on two floors and stoa in Site 5 to occupy one floor.⁶²

Supporting a wide array of tenants

In Quayside, stoa can transcend the traditional retail strip to become its own diverse micro-neighbourhood. That means integrating pop-up markets, civic gatherings, arts and

cultural events, health services, work stations, community classes, and even light production facilities alongside traditional stores and everyday essentials.



Weaving publicly accessible space throughout Quayside

The public realm typically ends at the walls of the buildings lining the streets. In Quayside, stoa would become an extension of the sidewalk, inviting pedestrians to wander through public markets, galleries, and community hubs, past plazas, production spaces, and shops, and connect through these interior walkways to the street on the other side.

Expanding the public realm network into the lower floors of buildings also creates new opportunities for exploration and connection. As people are drawn through the site along new pathways that weave through, between, and around buildings, they can encounter the range of diverse experiences and new chances for discovery that are the strength of thriving cities.

Key

Loading and operations space

Publicly accessible space

Four types of programming on Quayside’s lower floors

First floor



Second floor



- Retail, food, and beverage.** Local retail and restaurants play an essential role in the street life of a community, satisfying basic needs (as in the case of grocery stores), offering outlets for creativity (artisan crafts), and facilitating connections (cafés). On Day One in Quayside, more than half of stoa space would be devoted to retail, food, and beverage, which can range from seasonal stalls to restaurants and clothing stores to commissary spaces.
- Production.** Production space has a vital role in the modern economy. In Quayside, artisan workshops, commercial kitchens, 3D printing, and other forms of light production would animate studios throughout stoa, with opportunities to sell wares to the public. Real-time building-code tools would help ensure that these facilities can coexist without excessive noise or nuisance impacts on surrounding tenants (see Page 77).
- Office space.** Stoa is designed to offer a variety of professional spaces, primarily on the second storey, including co-working stations for individuals and offices for businesses. Co-working stations could be permanent or operate during certain hours, similar to the Toronto startup FlexDay, which converts restaurants and bars into work spaces before the evening rush.
- Social infrastructure space.** Quayside’s community spaces include the proposed Care Collective, which would provide health and well-being services and programming, as well as the Civic Assembly, which would become the hub for the community, arts, and cultural gatherings. These spaces would exist near cultural, educational, and recreational areas to nurture the interactions that build relationships and forge a healthy, vibrant, and engaged community. (See Page 216 for more information about the Care Collective and Civic Assembly.)

Preparing for the future of retail

Market forces, such as online shopping, are changing the future of brick-and-mortar businesses. In Quayside, stoa space will offer retailers the chance to experiment with different physical, operational, financing, and leasing models.

As part of its planning process, Sidewalk Labs interviewed 30 business owners about the challenges facing the retail sector, from lengthy

launch timelines that drive up costs, to inflexible spaces that cannot adapt to changing market needs, to storage constraints that put small businesses at a disadvantage.

Stoa's adaptable design can help address these challenges by supporting entrenched, beloved businesses as well as up-and-coming entrepreneurs. Its flexible floor plate enables stores to evolve in response to market forces

while reducing economic and logistical barriers for aspiring retailers to test concepts. A proposed digital leasing service, Seed Space, would show all available spaces, possible configurations and fit-out options, leasing durations and terms, and potential matches for co-tenancy.

Low-risk physical space.

Opportunities for shorter lease terms (one-month versus traditional 10-year leases) and alternative leasing models (charging tenants a percentage of their sales versus a fixed rent) — all easily accessible through Quayside's leasing service — would help businesses open and evolve.



Business collaboration.

Adaptable spaces and a digital leasing platform enable businesses to connect with other businesses to exchange tips and discuss best practices, plan joint programs and marketing efforts, or even find co-tenants — for example, a flower shop could connect with a pop-up jazz club for evening events.

“We are actively looking for ways to partner with complementary businesses. The more integrated the experience we offer, the better.”

— Canadian General Merchandise Retailer

“Everyone ... is experimenting with different formats right now, as are we, but it is very expensive to flex our existing space.”

— Toronto Grocer



Integrating on- and offline.

Online retailers are turning increasingly to temporary spaces as a way of spreading the word about their brand or meet customers where they live. In Quayside, online businesses would be able to rent small spaces to meet customers in a store and to match those rent times to promotional campaigns.

“We get reasonable traffic online, but they only really become our customer when they get to know us in store. We aren't sophisticated enough to start that conversation online.”

— Toronto Apparel Retailer



New inventory strategies.

Quayside's on-site storage service at the logistics hub could free up retail stores to act more like showrooms, with the ability to send products directly to customers who live in the neighbourhood (via the neighbourhood's automated freight system) or to those who live elsewhere (via trucks from the logistics hub).

“Managing backroom inventory can be a challenge. It requires constant monitoring and can take associates away from the sales floor where they could be helping customers.”

— Multinational Merchandise Retailer

Startup support

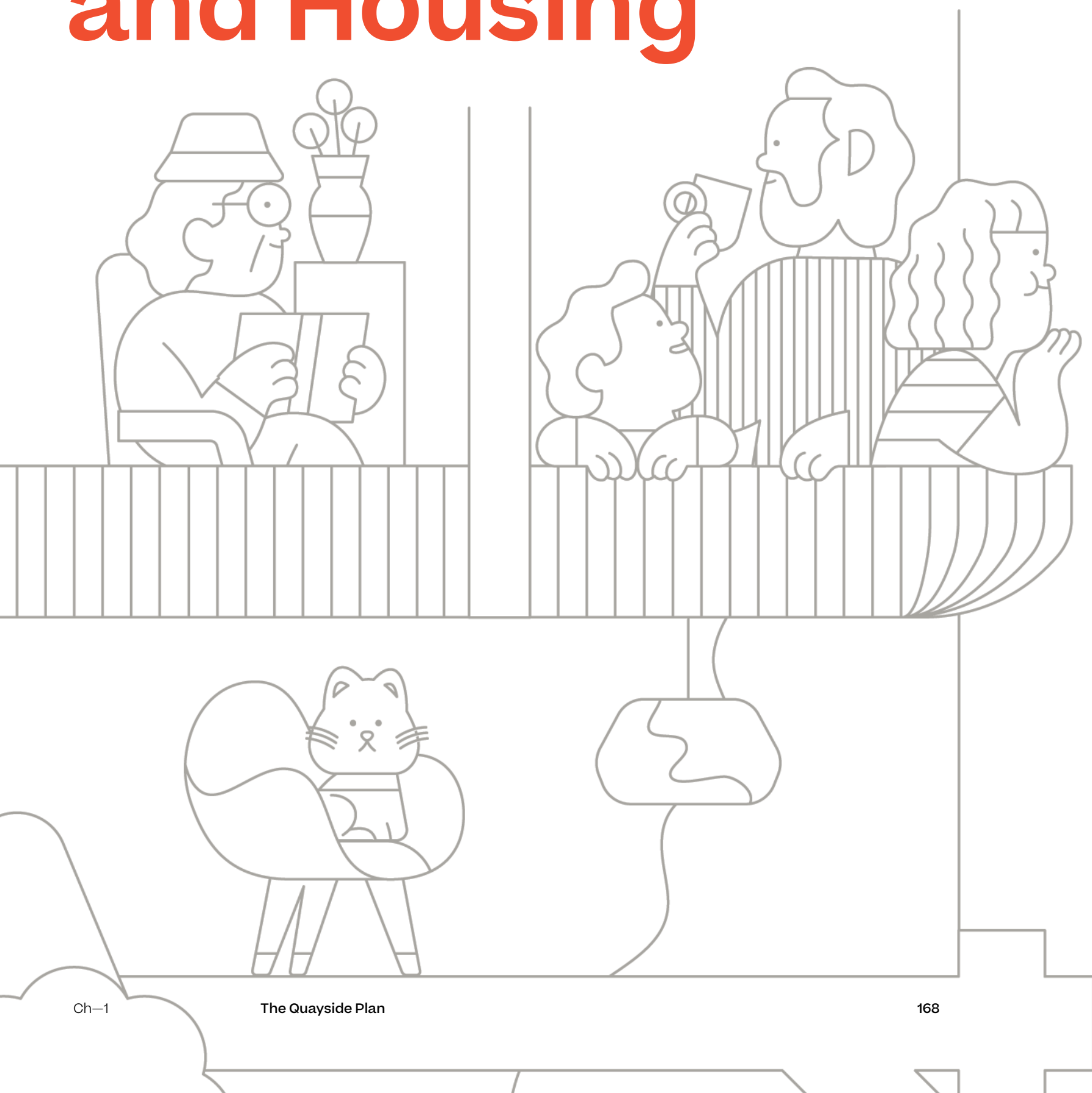
Incubating small businesses

Aspiring entrepreneurs all have different dreams, but they face common challenges: limited capital to cover startup costs, operating expenses, and long-term leases, and a lack of experience navigating logistical and bureaucratic hurdles. Certain groups face additional barriers as they attempt to enter fields where they are underrepresented and potentially overlooked.

To help these groups thrive, Sidewalk Labs plans to issue a Request for Proposals for partners to launch and operate a small business incubator designed to provide training and support to small business entrepreneurs across the Greater Toronto Area.

A portion of stoa space in Quayside would be reserved for these businesses at below-market rent, enabling entrepreneurs to test their ideas and sharpen their business skills in a low-risk environment. Participants would also have access to shared fabrication equipment such as 3D printers, laser cutters, and robotic routers in the central community hub called the Civic Assembly (see Page 224 for more details), as well as use of the shared commissary kitchen spaces.

Buildings and Housing



Sustainable buildings that can be constructed and adapted far more quickly, and a new set of financial and design tools that help improve affordability and expand options for all households.



See the “Buildings and Housing” chapter of Volume 2 for more details on the urban innovations described in this section.

Building a more affordable and inclusive neighbourhood

Quayside’s innovative approach to buildings and housing — including factory-produced mass timber, flexible floor plates, and an ambitious affordability program — would create a neighbourhood that is more inclusive and responsive to evolving community needs.

For two years running, Toronto has hoisted more construction cranes than any other city in North America.⁶³ But to remain a leader in openness and inclusion, Toronto must continue to push for greater levels of affordability and economic opportunity during the building boom. That goal involves helping developers meet new demands for housing by completing projects more quickly; creating true live-work

communities that host a lively mix of homes, offices, shops, and services; and finding new ways to expand support for affordable housing.

The 2.65 million square feet of built space in Quayside can forge a new paradigm. Quayside would be the first neighbourhood built entirely of mass timber, an emerging material as strong and fire-resistant as steel, but easier to manufacture and far more environmentally sustainable. Flexible floor plates can accommodate multiple uses at once, enabling a complete community that provides every need — housing, jobs, shopping, childcare — within a short walk. When coupled with an ambitious, wide-ranging affordable housing program, this plan can recreate the kind of welcoming, integrated Toronto community that has defined the city for decades.

A more welcoming neighbourhood

Quayside’s buildings are designed to foster a welcoming spirit where everyone can find their place: from the warm, wooden construction of varying heights that top out at around 30 storeys; to the open, flexible ground-floor spaces and commercial offices designed to nurture aspiring entrepreneurs alongside established businesses; to the array of housing options that support a wide range of lifestyles and incomes.

A more affordable neighbourhood

The Quayside plan creates a more affordable community for more people. A new factory-based building approach can accelerate project timelines while reducing costs and uncertainties for developers, helping them create mixed-income housing. Quayside’s proposed housing units leverage more efficient designs and off-site storage to further reduce costs. But to create a truly inclusive community, additional action is needed, so Sidewalk Labs proposes to devote 40 percent of Quayside’s housing stock to below-market units.



A more responsive neighbourhood

Quayside’s buildings are designed to support the community’s evolving needs. Flexible floor plates and movable walls enable residents and businesses to adapt their spaces quickly and inexpensively as their situations change — or to shift uses entirely. By accommodating this mix of housing, retail, offices, light production, and community spaces, every resident can meet their needs within a short walk. As described on Page 77, a proposed digital building code system could help ensure that this vibrant mix of uses can thrive without creating nuisances, such as noise.



Site 1 Site 2 Site 3 Parliament Plaza Site 4 Silo Park Site 5 Keating Channel Villiers Island

Achieving sustainable construction with mass timber

The Quayside plan calls for all buildings to be made from an emerging material known as mass timber, which is as strong and fire-resistant as steel, easier to manufacture, and dramatically more sustainable.

While most mid- and high-rise buildings in cities are currently constructed out of steel or concrete, these materials come with downsides. They are increasingly expensive — in Toronto, steel prices rose 16 percent in 2017 alone⁶⁴ — and they are difficult to produce, assemble, and transport, leading to lengthier, costlier, more disruptive construction projects. They also bear a steep environmental cost: concrete and steel emit CO₂, whereas timber sequesters CO₂.⁶⁵

Cities like Toronto have started to explore a promising alternative: an emerging type of engineered wood called mass timber. Mass timber has been successfully tested in Toronto and is particularly well suited for factory-based construction, an approach in which building parts are created in an off-site facility and shipped to a site for faster assembly. For Quayside, Sidewalk Labs proposes to advance these efforts by supporting the launch of a factory in Ontario that would process mass timber building parts, reducing construction timelines by as much as 35 percent⁶⁶ and catalyzing a new industry around this sustainable material.

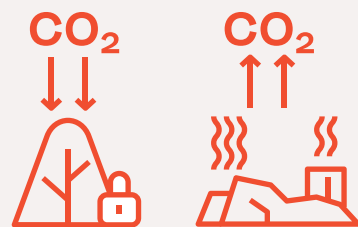
Accelerating construction through modular buildings

The Quayside plan uses factory-produced mass timber to construct buildings faster and more sustainably, without sacrificing safety or architectural excellence.

Virtually every construction project suffers from a complicated construction process that faces logistical challenges from heavy materials like concrete and steel, relies on significant on-site fabrication work that generates considerable waste, and requires going back to the design phase for aspects of a plan that fail to meet code. As a result, delays drive up costs and tie up streets with disruptive noise and blockages. Factory-produced buildings can streamline the process but have traditionally resulted in limited designs.

Quayside plans to achieve a new standard for modular construction that creates unique, efficient, and sustainable buildings. An off-site fabrication process — with each building component pre-reviewed by the city — would reduce uncertainty in the construction process, accelerate assembly, reduce waste, limit neighbourhood disruption, and improve site safety. A customizable library of building parts would enable architects to benefit from these efficiencies while still creating radically different designs.

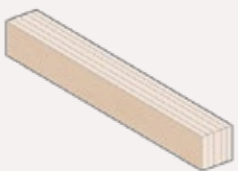
Quayside can be the catalyst for a new, sustainable mass timber industry in Canada.



Sustainable material. Forest-harvested timber sequesters carbon, trapping 1 tonne of CO2 in every cubic metre of wood.

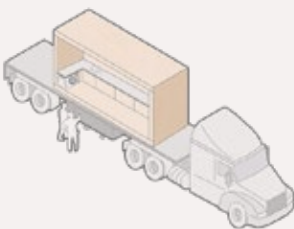
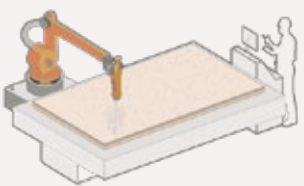
Timber production and products

The factory would process two mass timber products: cross-laminated timber structural panels (CLT) and glulam beams, each created by combining three to seven layers of wood, milled about 25 millimetres thick.



A Glulam structures. The wood pieces in glulam beams are glued together with grains in the same long direction, creating superior load-bearing strength. In Quayside, glulam structures (along with CLT floor panels) would be used to develop buildings around 30 storeys tall.

B CLT panels. The wood pieces in CLT panels are glued together with grains at perpendicular angles, then compressed into panels that can self-support a 12-storey building.



C Shikkui plaster. Shikkui plaster is a Cradle to Cradle certified sustainable material that has a fire-resistance rating comparable to that of drywall and many additional advantages, including health benefits (it is a natural killer of bacteria and mold), faster application times (cutting the time typically devoted to paint and drywall in half when mechanically applied in a factory), and a green waste stream (recyclable as plant-beneficial fertilizer).

D Efficient shipping. Factory-produced modular parts are designed to maximize shipping in a standard truck. The lightness of timber allows trucks to be more fully packed, as compared to shipping concrete or steel, reducing the number of site deliveries by 85 percent.⁶⁷

Library of building parts and digital design

To accelerate project timelines, improve predictability, and reduce costs in a holistic way, Quayside's buildings would draw from a complete library of factory-made building parts that can be customized for each project to allow for a diverse and interesting variety of buildings that achieve design excellence. A digital coordination system would ensure that these parts can be efficiently sourced and fabricated.

Local sourcing

Spruce trees from the boreal forests of Quebec and Ontario and Douglas fir trees from British Columbia would supply the wood for mass timber construction.

Ontario-based factory construction

Operating in collaboration with Canadian foresters, sawmills, and other industry partners, a new Ontario-based factory would process building parts out of mass timber, catalyzing a new Canadian industry.

New Ontario-based factory

Well-managed forests thrive

Collaboration with local sawmills

Day 0 to Day 10 – Fabrication starts

Faster assembly

Quayside’s factory-based mass timber buildings can be completed 35 percent faster than traditional concrete construction — including basic structural assembly as well as the installation of all finishes, the connection of all electromechanical equipment, and the execution of all tests.

The reasons for faster completion include the off-site fabrication of tricky building components such as kitchens and bathrooms, as well as modular cores that integrate elevator supports. Building components would be cut into assembly-ready posts, beams, and panels at the factory and fitted with interlocking metal cleat technology that makes it easy to snap parts into place quickly. Additionally, the lightness of mass timber structures would require less extensive foundations.

Concrete cores

Modular cores that are fabricated off-site and integrate elevator supports can better match the timber assembly timeline, speeding the overall pace of construction.

Traditional approach: Cast-in-place concrete cores need to be poured before other components can be assembled, a much lengthier process than modular assembly. Temporary, expensive construction elevators are required to deliver materials.

Kitchens, bathrooms, and HVAC systems

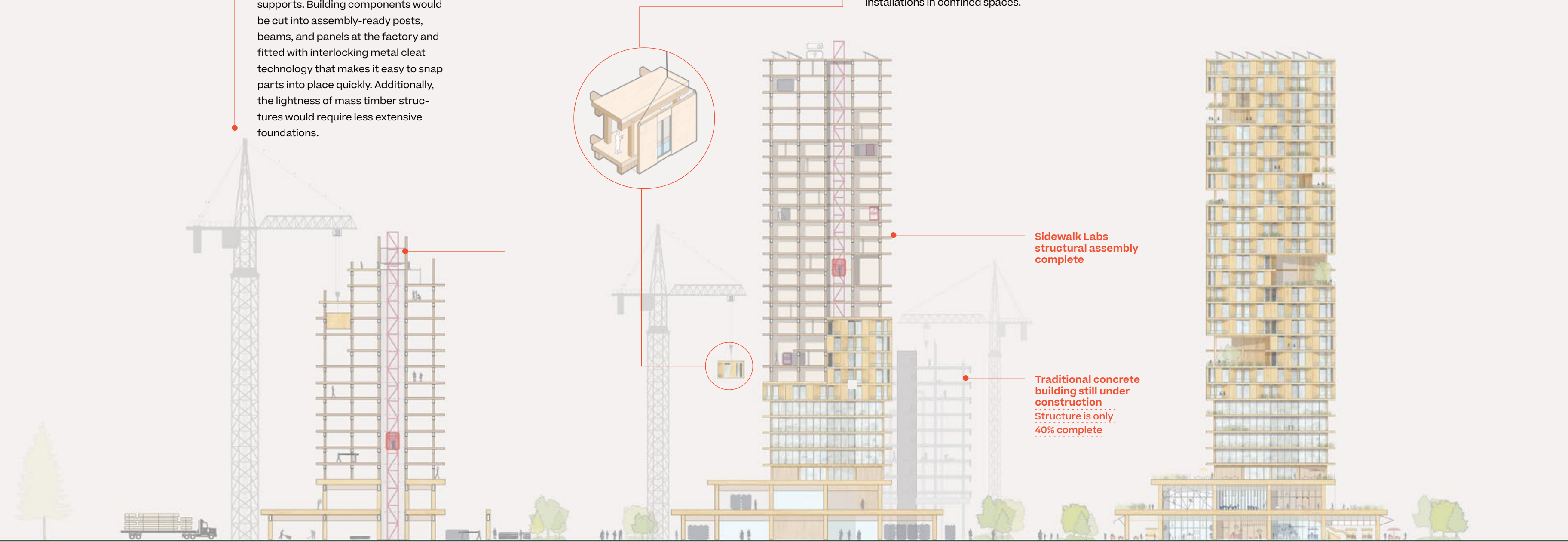
Off-site fabrication of kitchens, bathrooms, and HVAC systems allows for greater quality control, more efficient inspection and commissioning, and faster installation.

Traditional approach: On-site installation of kitchens, bathrooms, and customized HVAC systems is a lengthy, complicated process due to multiple trade workers needing to layer in their installations in confined spaces.

Tall timber building completed

35%

faster than traditional buildings



Days 11 to 23 – Structural assembly working

Days 24 to 43 – Assembly of modular components

Fully operational at 18 months – Completed tall timber building

Creating flexible building interiors

Quayside buildings would feature adaptable floor plates and interior walls to improve flexibility, renovation speed, and affordability — helping the neighbourhood evolve.

Adaptable building spaces enable a community to respond more effectively to larger trends and changing markets. But today, renovating a building space to accommodate a new use requires a lot of time and money. Walls are lined with electrical wiring, pipes, sprinkler systems, and other infrastructure, making them difficult and expensive to move. That can make it hard for businesses and residents to find locations that can adapt to their changing needs, whether that is a shop seeking to expand or empty-nesters looking to downsize.

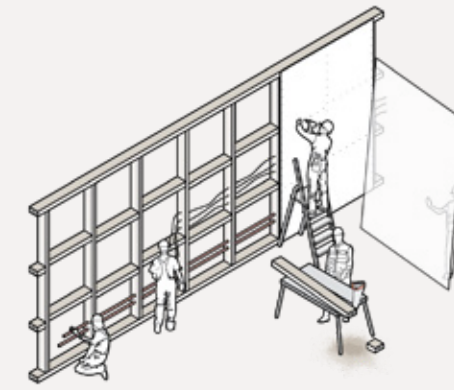
Quayside's buildings would leverage adaptable Loft space to keep pace with the evolution of the neighbourhood and the needs of individual tenants. Loft is designed for flexibility, incorporating reconfigurable floor plates, high ceilings, and movable interior wall systems freed from the traditional tangle of wiring and pipes. These designs enable businesses and apartments to expand or shrink quickly and inexpensively and help spaces shift between commercial and residential uses.

Innovative building components that enable flexible wall systems

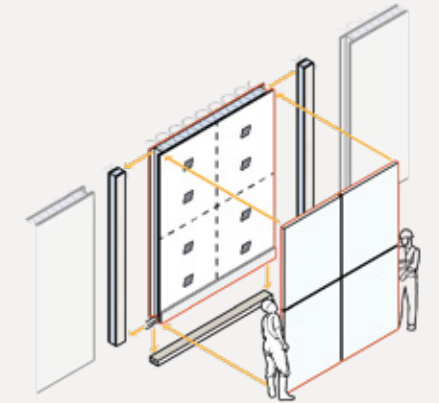
Commercial.

Renovating a traditional commercial space (left) for a new use can be a lengthy process that requires knocking down walls to move utilities and power systems embedded within them.

In contrast, Loft's flexible interior walls (right) are designed with modular fittings and mounted (rather than embedded) utility and power systems for fast renovation.



Traditional approach

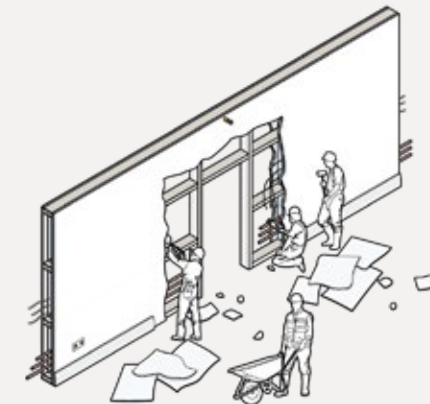


Sidewalk Labs approach

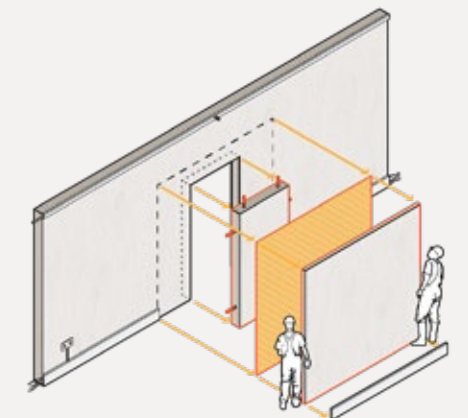
Residential.

As with commercial spaces, changing traditional residential units often requires substantial renovations that involve knocking down walls and relocating utilities (left).

Residential flexible walls (right) would be fabricated in the factory and arrive at the construction site nearly complete. When a residence needs to expand, the removal of a prefabricated wall section would connect the residence to an adjacent room in hours and would generate no renovation waste.



Traditional approach

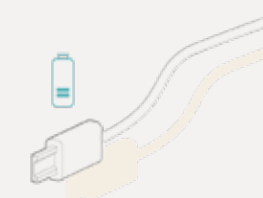


Sidewalk Labs approach



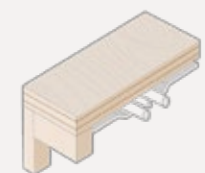
Mist-based fire protection systems.

These systems are equally effective as traditional sprinkler systems yet use 10 percent of the water volume, reducing potential flood damage. Smaller, surface-mounted tubing can be hidden in moldings and easily moved during renovations.⁶⁸



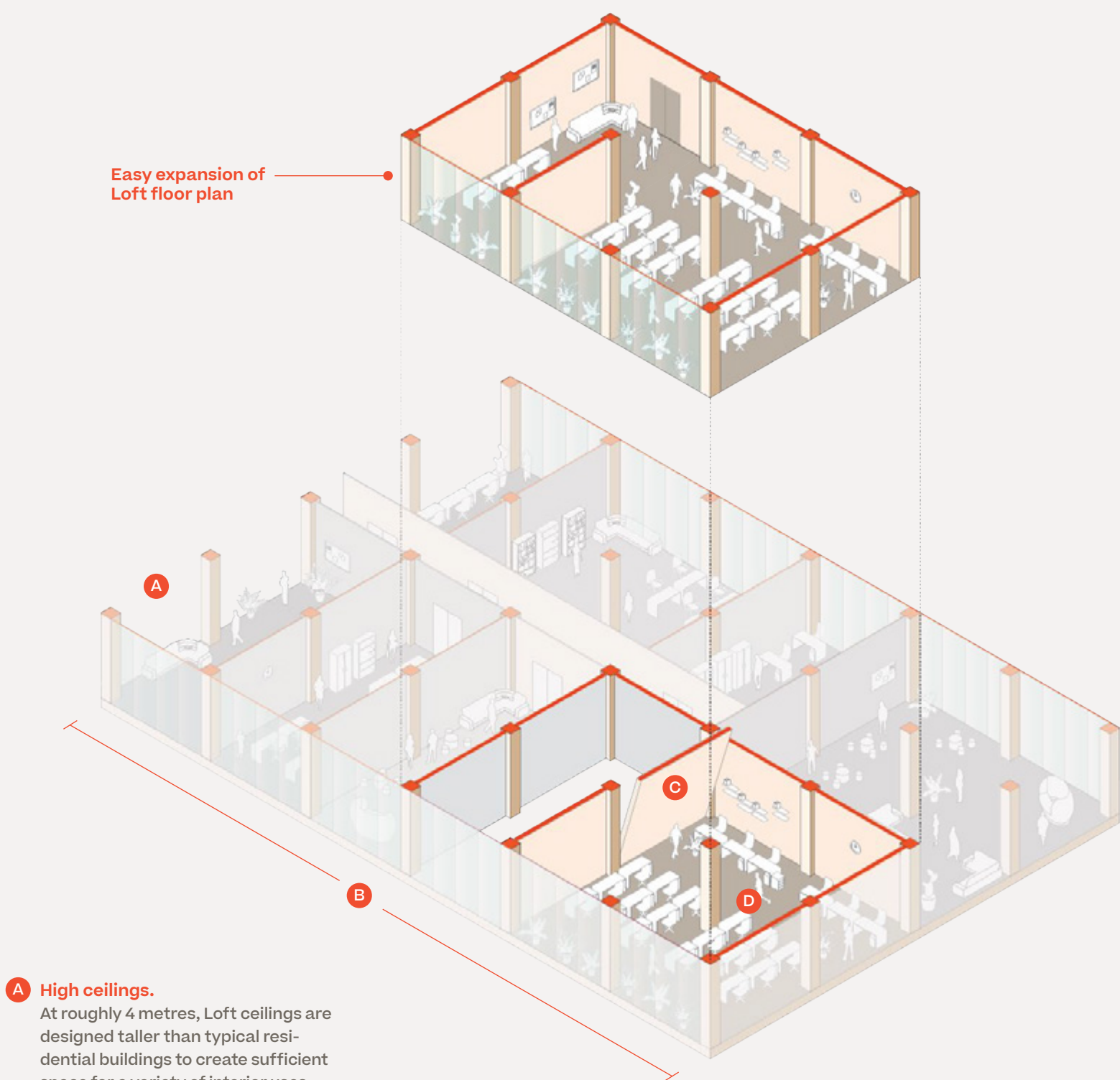
Low-voltage DC power systems.

These systems reduce fire risk over traditional AC power systems and can run through the baseboard, allowing for faster reconfigurability of walls. They also require 50 percent less wiring.⁶⁹



Utilities.

Utilities typically embedded in traditional walls can be moved to floor boards or crown molding, making the interior wall system far easier and less expensive to reconfigure.



A High ceilings.
At roughly 4 metres, Loft ceilings are designed taller than typical residential buildings to create sufficient space for a variety of interior uses, such as art studios, small businesses with lots of inventory storage, or smaller apartments that feel more comfortable with higher ceilings.

B Long floor spans.
At 27-by-33 feet, with few columns interrupting the space, Loft floor spans provide for the flexible arrangement of spaces and make it easier to subdivide the same space for new uses.

C Loft flexible walls.
Equally strong as typical walls, Loft's flexible interior walls are designed to accelerate renovation by hiding power and sprinkler systems instead of embedding them within walls.

D Modular fittings.
Loft's doors, interior walls, finishes, and other modular fittings are designed to be interchangeable across all uses, as well as to be reusable.

Creating three unique designs from one library of parts

Using the same set of modular components, three global architecture firms developed creative design concepts for Quayside's mass timber buildings.

The library of building parts created and assembled in an off-site factory would include structural pieces (such as glulam beams and CLT panels), exterior facades and windows, interior wall systems, kitchen and bathroom systems, and roofs.

These parts would be produced in sufficient volumes to reduce both costs and sourcing time for developers and contractors. Sidewalk Labs has started to work closely with local regulators to enable these pieces to be pre-approved, creating more certainty around construction timelines and the permitting process. And these parts would still be customizable by architects seeking to deliver distinctive designs.

To help bring the vision for a more affordable and sustainable Quayside to life, three leading architecture firms — Heatherwick Studio, Snøhetta, and Michael Green Architecture — used this library of parts to conduct design explorations that prioritized a mix of uses throughout buildings, energy-efficient building design, and the needs of a diverse population.

As the following pages demonstrate, new developments can achieve design excellence by providing the tools for different architects to reconfigure and assemble these same basic building blocks in thousands of original ways, allowing for truly unique, customizable, and welcoming spaces.



Michael Green Architecture is a leading Canadian architecture firm and an innovator in mass timber building design.
Credit: Michael Green Architecture



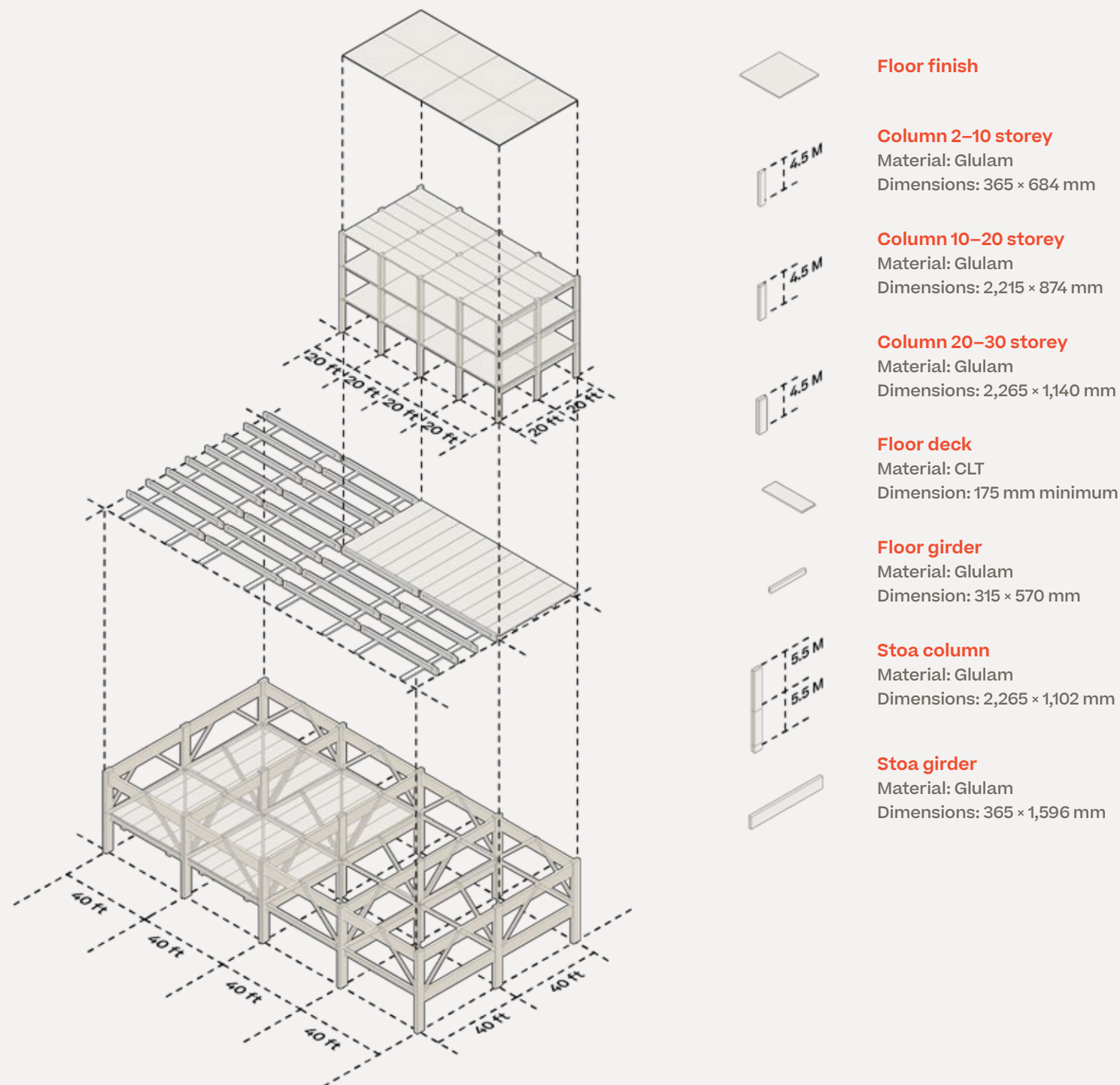
Snøhetta is an international architecture firm that recently completed the Ryerson University Student Centre in Toronto and the new Central Library in Calgary.
Credit: Snøhetta



Heatherwick Studio is an international firm focused on large-scale architectural, space, object, and infrastructure projects in cities all over the world.
Credit: Picture Plane for Heatherwick Studio

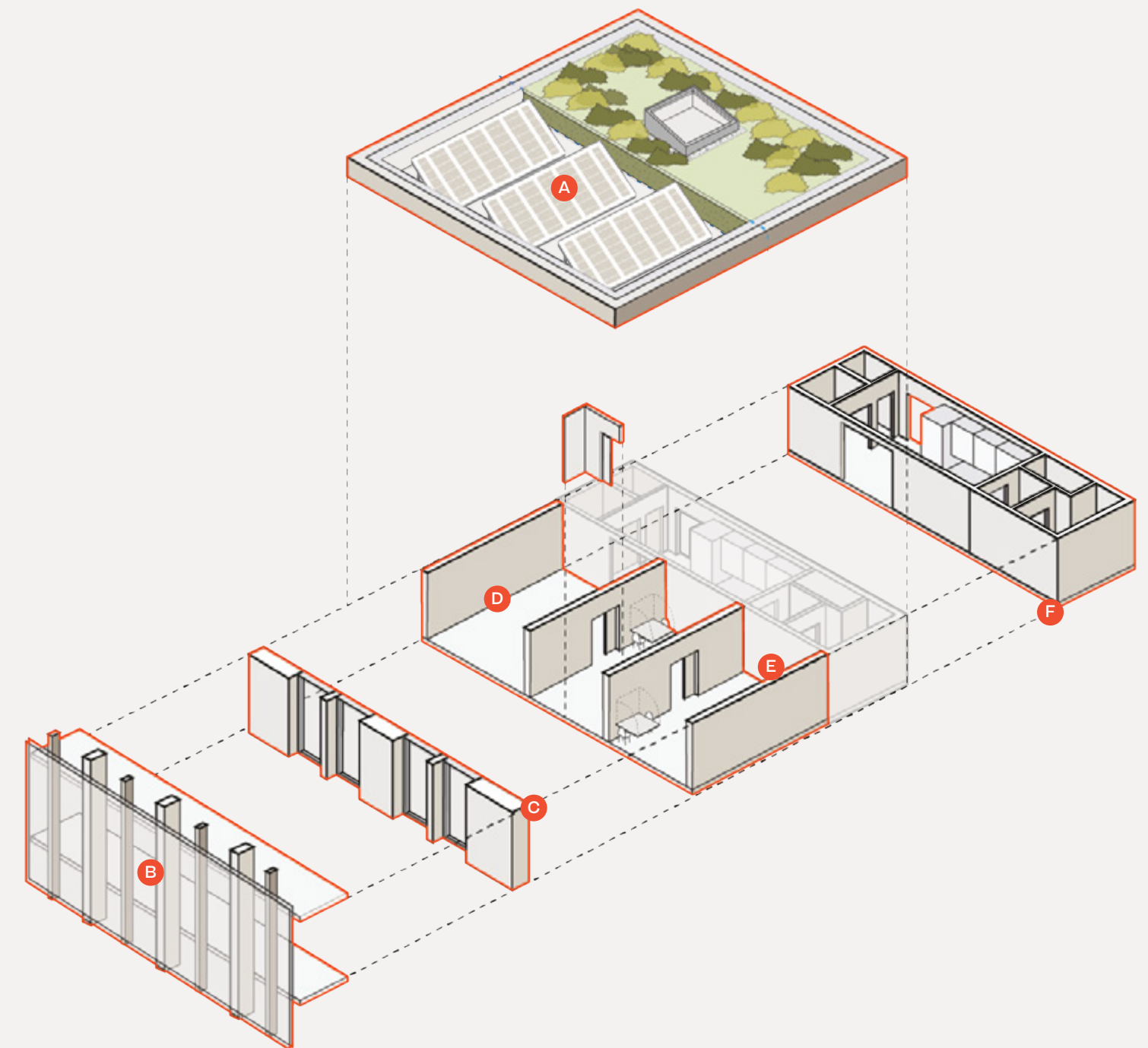
Using the mass timber library of parts

Structural components



Modular building components

- A Building roof** options would include photovoltaic roofs that harvest solar energy, green roofs to integrate nature, and “blue roofs” to help manage stormwater.
 - B Exterior facades and windows** would be part of a customizable facade system that could reflect unique architectural visions.
 - C Exterior wall systems** could feature many different materials and create an airtight building seal that reduces the need for heating and cooling.
 - D Interior structural wall systems** could be made out of CLT panels.
 - E Interior non-structural wall systems** could be clipped into place for faster, easier renovations while remaining as strong as traditional interior walls.
 - F Kitchens and bathrooms** would be preassembled off-site for faster, higher-quality installations.



Library of parts interpretation: **Michael Green Architecture**

Sites 1 and 2



“Designing with the toolkit allows us to create a diverse range of public and private spaces that enhance the quality and value of our built environment. These new neighbourhoods, composed of wood, natural materials, and garden spaces, strengthen our connection to our homes, communities, and environment.”

— Michael Green, Principal Architect

Credit: Michael Green Architecture

Library of parts interpretation: **Snøhetta**

Sites 3 and 4



“Working with Sidewalk Labs’ toolkit for mass timber structural systems provided a unique challenge. Our design team took advantage of the flexibility and modularity of these systems, such as in the stoa and plazas. Yet we also found ways to unlock new formal possibilities, such as the double-curved form of the commercially programmed ‘hull.’ Finding ways to playfully stretch the model allowed us to create compelling, site-specific architecture from the standardized kit.”

— Matt McMahon, Project Leader



Credit: Snøhetta

Library of parts interpretation: Heatherwick Studio

Site 5



Credit: Picture Plane for Heatherwick Studio

“At the beginning of our study, we asked ourselves: can buildings created using a repetitive modular construction system still be expressive and unique? In fact, using the system freed us from the distractions of ‘how’ and allowed us to focus on a design driven by the specifics of the site: the need for an intimate human scale intertwined with the public realm and a vibrant waterfront.”


— Charlotte Bovis, Project Leader



Making housing more affordable for more people

The Quayside plan proposes an ambitious affordability program that sets aside 40 percent of units for below-market housing, creating new living opportunities for households across the income spectrum.

For decades, Toronto forged an identity as a city of diverse neighbourhoods, with a flourishing middle class thriving at its spiritual — and geographic — heart. But Toronto’s recent success and rising construction costs have forced it to reckon with a challenge faced by many other growing cities: an increasingly urgent affordability crisis. Since 1970, Toronto has tended to sort itself into “Three Cities”: wealthy areas downtown, low-income areas forced to the edges, and middle-income pockets that continue to shrink.⁷⁰ Limited housing size options and an aging rental stock have further led to inadequate choices for multi-generational, single-person, and middle-income households.

A mix of incomes, lifestyles, and life stages is a foundational element of urban life, generating a neighbourhood’s sense of community and its energy. That is why Quayside’s housing program has been designed to set a new standard for inclusive communities. An ambitious affordability program creates opportunities for residents across the income spectrum, including lower-income tenants and middle-income households unable to afford market-rate units or hefty down payments. Every unit is designed to reflect a broader effort to offer a wider range of housing options that enable more affordability across the board and meet the evolving needs of Toronto’s diverse households. 

See the “Buildings and Housing” chapter of Volume 2 for more details on Sidewalk Labs’ housing vision.

40% below-market housing

The Quayside housing plan includes 40 percent of units at below-market rates, outpacing recent development on the waterfront and downtown. This affordability program features unusual depth and breadth, including 20 percent affordable housing, at least a quarter of which would be available to lower-income tenants with “deep” affordability needs and be operated by experienced non-profits. Quayside would also devote 20 percent of units to middle-income Torontonians who are currently struggling to afford market prices.

40% family-sized units

Toronto households are evolving — they are increasingly single, senior, and multi-generational — and so are their housing preferences. The Quayside plan offers an array of new housing options, including family-sized units from two to four bedrooms, co-living options that offer more communal supports, and efficient units with flexibility to grow or shrink as needs and households change.



Efficient unit designs.

Quayside’s proposed efficient apartments would be 7 percent smaller on average than equivalent traditional apartments. Reducing unit footprints enables the creation of more units and increases revenue potential, allowing developers to meet greater affordable housing commitments. Clever design maximizes the space in these units, including features like convertible furniture, built-in shelving, and fold-out tables and beds to improve livability.

Healthy, warm interiors.

Quayside’s mass timber buildings would offer warm, inviting spaces with exposed wood and elegant finishes. Exposed wood also unlocks “biophilic” health benefits, such as reduced stress, that have been shown to occur with exposure to nature in cities.

Off-site storage.

Residents would have access to off-site storage space at the neighbourhood logistics hub, with packages sent and delivered on demand by self-driving dollies and tracked via app.

Borrowing library.

Residents could summon useful items that are too bulky to store inside an apartment (like ladders) from a borrowing library at the logistics hub, via on-demand delivery.

Communal spaces.

Residents in co-living units could access communal spaces, such as extra bedrooms for visiting family and friends or large dining spaces for hosting dinner parties.

50% rental and 50% ownership

Creating a rental pipeline is an essential element for all cities seeking to build mixed-income communities, offering an entry point that does not require a large down payment and providing more flexibility than home ownership. Estimates suggest that Toronto must build 8,000 rental apartments a year through 2041 to improve affordability.⁷¹

The Quayside plan includes 50 percent purpose-built rentals to address the pent-up demand in Toronto. In addition to these rentals and traditional ownership options, the Quayside plan explores alternative ownership models, such as shared equity, which allows families to put a down payment on a portion of an apartment, enabling them to build equity with a lower up-front cost.

Creating housing options across a lifetime

Housing options should be as dynamic and adaptable as the families that live in them. Quayside's wide range of options are designed to meet the needs of residents as they evolve across a lifetime.

Quayside's housing program promises to do more than attract and support a range of people from across the socio-economic spectrum — it also recognizes that, across a lifetime, housing needs, budgets, and aspirations change.

Part of creating a complete community is ensuring that residents can find a comfortable home no matter their stage of life. Whether residents are recent college

graduates, newlywed couples, young parents, empty nesters, or on another life path entirely, Quayside can support their journey with housing that is appropriate and affordable.

These pages tell one hypothetical story for how a resident might grow within Quayside, across the neighbourhood's full spectrum of types and tenures.



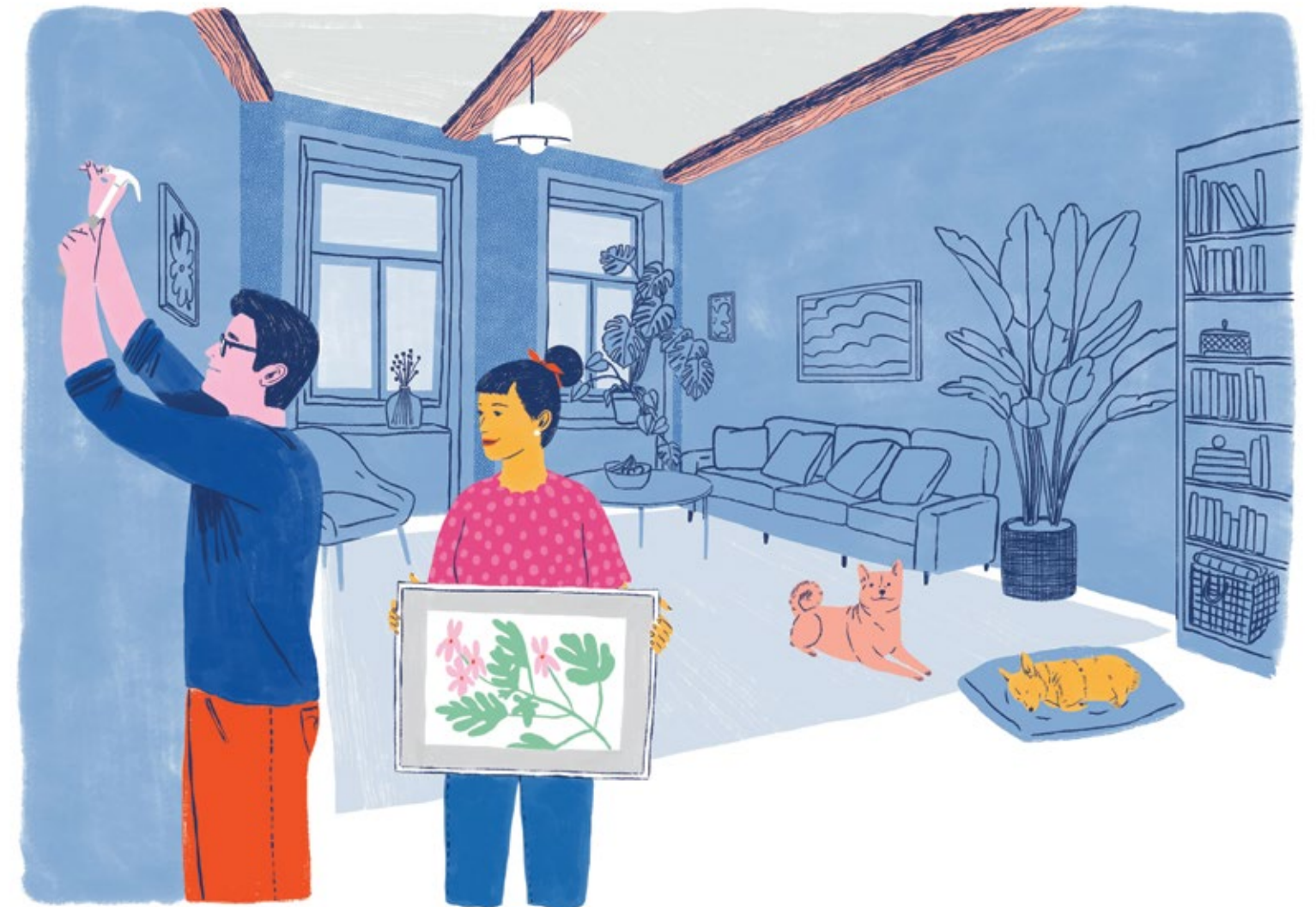
Jaime moves to Quayside after college.

After taking a new job, Jaime searches for an apartment close to the office, a network of friends, and the amenities and convenience of downtown. The catch? Budget. A sleek ultra-efficient studio in Quayside — renting for less than other downtown studios — is a perfect fit. In addition to the affordable cost, the apartment features space-saving furniture and energy-efficient ventilation systems designed to improve interior comfort.

Jaime gets married.

Jaime falls in love at a dog park in Quayside. The couple decides to move in together, but even with two incomes they cannot afford to buy a condo. Instead, they put their savings towards a small down payment for a shared equity unit. The total monthly cost — 25 percent in mortgage, 75 percent in rent— is

in line with similar one-bedroom rental units but allows them to build equity on the portion they own. The well-designed space offers exposed wood and off-site storage for their combined possessions.





The family has kids.

By the time Jaime’s family welcomes its second child, they have enough savings to explore condo options. With the appreciation from reselling their shared equity unit, they put a down payment on a two-bedroom condo. The family enjoys Quayside’s expanded set of

parks, plazas, and public spaces — comfortable year-round thanks to weather-mitigation systems. A few years later, after a next-door neighbour moves out, they are able to expand their unit by removing one of the building’s flexible interior walls.



The couple ages in place.

In their later years, as empty nesters, the couple downsizes to a two-bedroom unit within a co-living community with shared building spaces that include guest bedrooms for visiting family, as well as other supports for seniors, such as good access to health programs on the ground floor.

Supporting aging in Quayside

With accessible design, affordable housing options, a network of amenities and programs, and strong social connections, Quayside could be a vibrant community where seniors can age with greater ease and dignity.

Seniors are the most rapidly increasing segment of the population in Canada⁷² and Toronto.⁷³ As reinforced throughout the Sidewalk Toronto public engagement process, the vast majority of seniors want to be able to live well in their own home or community for as long as possible. However, for some, living independently becomes increasingly difficult with age.

To support the ability of residents to age in their communities, Sidewalk Labs partnered with the Futures Team at SE Health, a non-profit social enterprise, to better understand how neighbourhood and home design, alongside social and health programming and services, could maximize well-being later in life.⁷⁴

Building on this research and community feedback, Sidewalk Labs proposes meeting (and whenever possible surpassing) AODA requirements⁷⁵ as well as other guidelines, such as the World Health Organization's recommendations for Age Friendly Cities.⁷⁶ Sidewalk Labs plans to ensure that 20 percent of residential units are built with flexible fixtures, such as height-adjustable sinks or light switches, that can be easily modified to seniors' physical needs.

Sidewalk Labs also plans to provide emerging housing types, such as co-living, that create communal supports; affordable housing options that can help seniors living on fixed budgets; and affordable space for health and community service providers, so they can be centrally located in the community.



The Quayside plan would support aging through residential unit design, communal supports, affordable housing options, and access to community services, among other approaches.

In addition to nearby access to formal health care and community services, older adults benefit from living in communities with strong social capital, where informal supports can be relied upon. Neighbours Helping Neighbours is an example of a programmatic approach to activating communities to support socially isolated seniors, who are at higher risk of poor health.⁷⁷ Currently being developed by the Health Commons Solutions Lab in Toronto, a cross-disciplinary group that co-creates local solutions to health challenges, the initiative will

assess seniors' well-being and respond to identified needs by matching individuals with programs, activities, or services that address their unique needs. Sidewalk Labs is working with the Health Commons Solutions Lab to identify where technology can add the greatest value to this solution by developing and piloting a rapid prototype in 2019.

In these ways, the Sidewalk Toronto project would create a vibrant, dense, multi-generational community where seniors can age with greater ease and dignity.

Sustainability



A new standard
of sustainability
that creates a
blueprint for truly
climate-positive
communities.



See the “Sustainability”
chapter of Volume 2 for
more details on the urban
innovations described in
this section.

Designing ultra-efficient, low-energy buildings

The Quayside plan includes buildings that feature ambitious energy-efficient construction inspired by the Passive House movement — meeting Toronto Green Standard Tier 4 for greenhouse gas intensity.

Toronto’s buildings account for roughly 60 percent of the city’s greenhouse gas emissions, predominantly by burning natural gas for heat and hot water.⁷⁸ Inefficient building designs — for example, with doors, windows, and exterior facades that leak heat — miss opportunities to conserve energy and improve comfort forcing tenants to compensate by using more energy.

In Quayside, Sidewalk Labs proposes to require that buildings meet rigorous energy-efficient building design standards inspired by the Passive House movement, including high-performing wall insulation, airtight exteriors, and

high-quality windows. Balanced ventilation systems would circulate fresh, filtered outside air year-round. On cold days, this system would transfer warmth from the older interior air to help the cool outdoor air reach the desired temperature with minimal energy use; on hot days, the system would transfer warmth and moisture from the incoming hot and humid outdoor air to the exhaust air, cooling and drying the new air supply and reducing the need for supplemental air conditioning.

Together, these efforts reduce the “loads” of buildings: heating, cooling, ventilation, and other systems needed for people to be comfortable. As a result, Quayside buildings would meet Toronto Green Standard Tier 4 for greenhouse gas intensity — the highest standard available.

Improving modelling through real-time metering. Today, a building’s energy usage is modelled during the design phase, prior to construction, but rarely revisited once the building is operational. In Quayside, operational building energy would be measured against the original design-level targets, providing invaluable data on the gap between industry-accepted modelling techniques and actual building performance — and helping to improve energy standards.

A Ultra-insulated.

Smarter installation strategies — such as high-performance windows, doors, fasteners, and facade design — would help the building resist heat loss and preserve interior temperature, like a thermos. They would also help prevent heat or cooling from escaping the building via conductive metal framing (known as “thermal bridging”).

B Airtight.

Airtight construction reduces the need to heat and cool buildings. Before opening, Quayside buildings would undergo “blower-door” testing to help expose and address air leaks. In blower-door testing, fans are placed in doorways to blow air inside and pressurize the building, which is then measured for how well it holds this new pressure.

C Air quality and heat recovery.

In Quayside buildings, fresh outdoor air would be filtered and ducted directly into living rooms, bedrooms, and office spaces, while old stale air would be vented out, ensuring high levels of air quality. Ventilation systems would be equipped with “heat recovery” devices that transfer heat and moisture between the warm and cool airstreams, reducing energy use. On particularly cold days, the air could be further heated before it is distributed throughout the building.

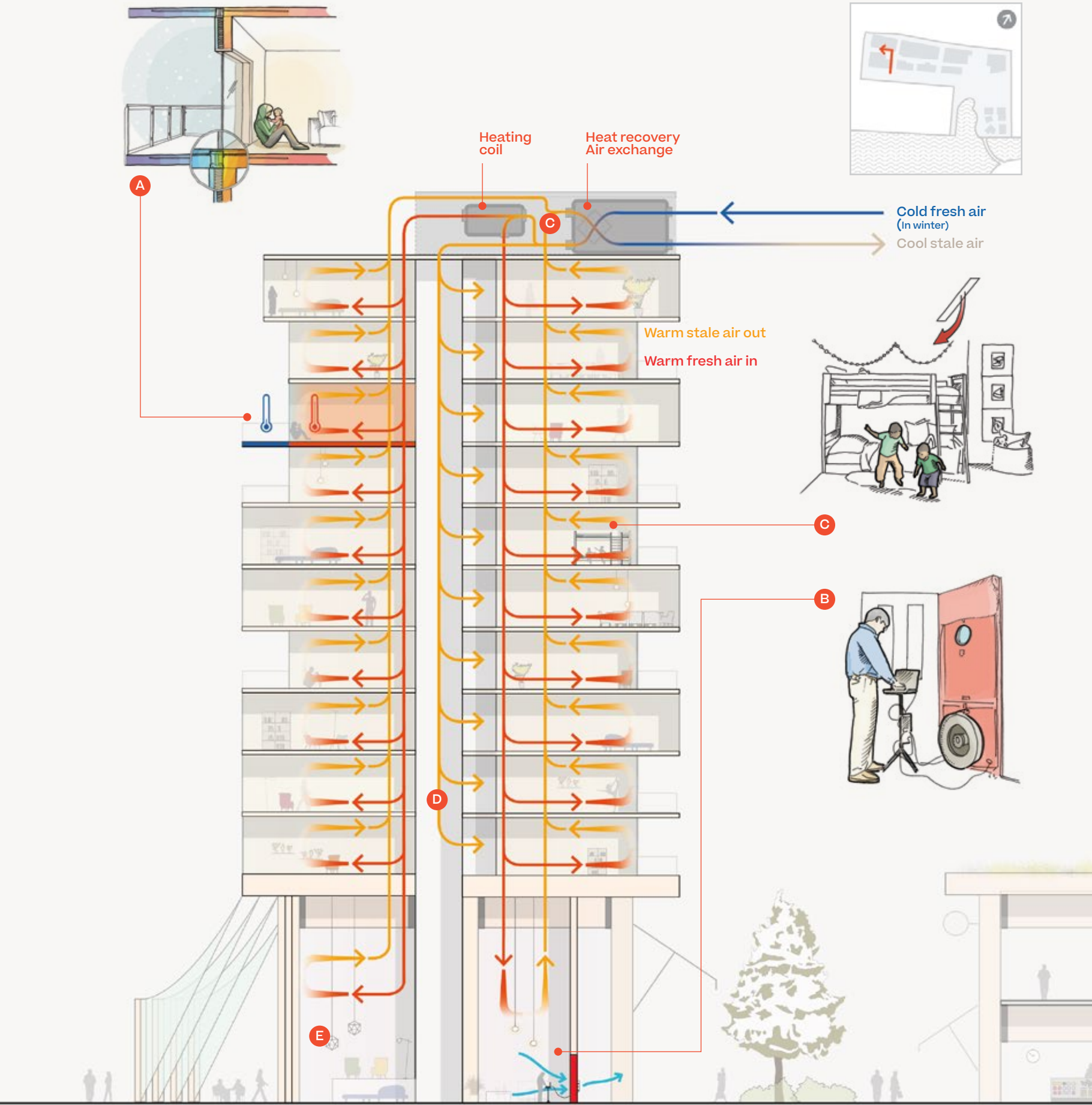
D Corridor conditioning.

Sidewalk Labs estimates that using heat recovery alone to temper the air in corridors can reduce building energy usage by as much as 20 percent.⁷⁹ This design means a hallway passage could be hotter or cooler than people’s homes, depending on

outdoor conditions, but as people generally dress for the outdoors when going out, it is not anticipated to significantly decrease comfort.

E Cold air curtain.

In summer, it is nice to get a cold wash of air conditioning when walking into a building lobby. But often the lobby as a whole is too cold, wasting energy. In Quayside, there would be no lobby air conditioning, but the lobbies — tempered using heat recovery only — would still provide a cool air curtain to offer initial relief for people as they enter the building.

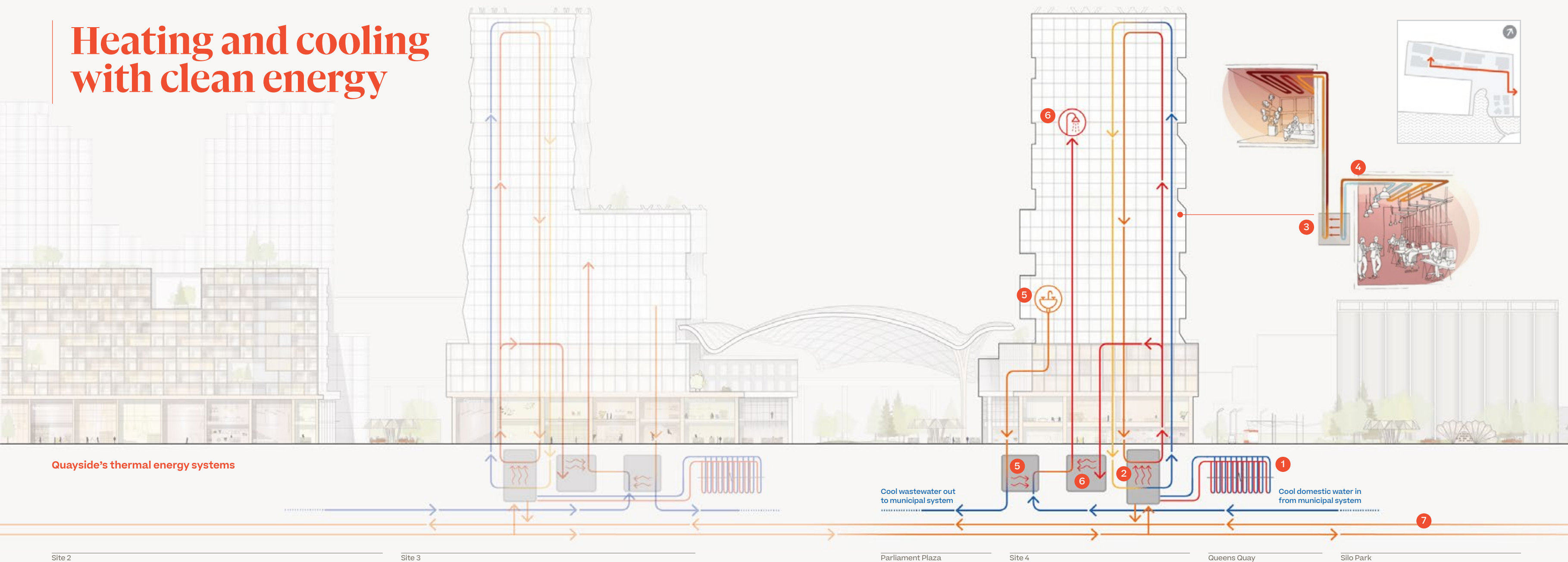


Quayside low-energy building systems in winter

Site 1 South

Pedestrian Walkway

Heating and cooling with clean energy



Quayside's thermal energy systems

Site 2

Site 3

Parliament Plaza

Site 4

Queens Quay

Silo Park

The Quayside plan recycles every source of “waste” heating or cooling created in its own buildings to keep residents comfortable. When that is not enough, it would draw from a “thermal grid” that runs on clean energy.

Low-energy buildings can dramatically reduce the need for additional heating and cooling. But even Passive House-inspired designs cannot eliminate that need, especially in a cold-weather climate like Toronto's waterfront. To deliver heating and cooling to residents and businesses without using fossil fuels, the Quayside plan would deploy a type of district energy system called a thermal grid.

Quayside's thermal grid would rely on clean energy sources to heat and cool buildings. At the building level, waste heat generated by wastewater would be repurposed to provide energy for heating and domestic hot water systems. For additional needs, buildings could draw from a hot and chilled water loop at the site level, generated by a mini heat pump plant that can exchange geothermal energy via underground wells.

A neighbourhood loop of the thermal grid would connect all of the site plants and allow for the transfer of energy among sites. It would also be designed to incorporate other large-scale clean energy sources in the future, such as heat recovered from sewage stations.

Why a thermal grid, not gas boilers?

Natural gas boilers are an inexpensive way to provide heat — much less expensive than geothermal wells. However, 87 percent of the greenhouse gas emissions from buildings in Toronto are associated with the use of natural gas for heating and hot water.⁸⁰ In addition, a building study commissioned by Sidewalk Labs discovered that Toronto multi-unit residential buildings were using 39 percent more gas for heating and 21 percent more gas for generating domestic hot water than shown in energy models.⁸¹ The Quayside plan aims to forgo gas altogether and move towards a system of low-energy buildings, geothermal heating, and affordable electrification.

1 Geothermal energy.

Quayside's thermal grid would use the bedrock of the Canadian Shield like a huge battery — storing heat that is pulled out of buildings in the summer for use in the winter through “geothermal wells.” Each site would host a small well field under its buildings, connected to a mini heat pump plant that distributes the heat. Wells would be drilled 244 metres into the rock.

2 Mini heat pump plant.

The mini heat pump plant would generate hot and chilled water, which would circulate to buildings through the site.

3 Waste heat.

One of the mini plant's sources of heating for hot water is the “waste” heat extracted from spaces in a building (such as busy offices), which can be given to other areas that need heat (such as residential apartments in winter). Up to 31 percent of Quayside's heating and 27 percent of its cooling requirements could be met using such waste heat.⁸²

4 Radiant ceiling panels.

Heating and cooling would be provided by radiant ceiling panels served by a building's heating and cooling loops.

5 Wastewater heat.

Domestic hot water would be pre-heated using heat recovered from bathrooms, kitchens, and other sources of building wastewater.

6 Domestic hot water.

After being pre-heated, water for domestic use would be further heated with an electric heat pump that draws heat from the loop serving the building's heating system.

7 Additional waste heat sources.

The thermal grid extends throughout Quayside and in the future could connect to additional sources of waste heat, such as data centres or municipal wastewater systems.

Using clean electricity and actively managing energy use

To help reduce greenhouse gas emissions and strive towards a climate-positive neighbourhood, the Quayside plan shifts from gas infrastructure to clean electricity and proposes to use new digital tools to help manage energy consumption.

In Toronto, residents and businesses draw power from a centralized electricity grid that can run primarily on clean energy sources (including nuclear, hydro, or renewables) during off-peak periods, such as overnight. But at peak times, when electricity demand is high, this grid must use a greater portion of natural

gas-generated power to meet the task, increasing the greenhouse gas intensity of the grid power supply as a whole. In addition to being expensive, natural gas-generated power has 15 times the GHG intensity of the Ontario grid’s current average,⁸³ so increasing its supply would increase both utility costs for households and businesses and GHG emissions for the community.

Quayside’s building systems are designed to help residents and businesses minimize their use of the grid’s most expensive and GHG-intensive power while providing new sources of clean energy, such as community

batteries (that store clean energy) and solar panels. These strategies enable Quayside to accommodate significant new electricity-intensive technologies — such as electric vehicles — without expensive power grid expansions that can often lead to higher utility bills.

A Low-voltage DC power.

Quayside’s buildings propose to incorporate a digital electricity power system that can travel over lightweight cables, such as ethernet cable, into residential units and offices, providing plug power for computers, lighting, and many appliances. (AC power would continue to operate for larger kitchen appliances, such as ovens.) As a controlled system that only sends power when a device is present, digital energy can dramatically reduce shock hazards and electrical fire risks.

B Solar and battery power.

Photovoltaic cells would be installed on every tower roof to capture almost 1 megawatt of solar energy, and batteries housed indoors would store 4 megawatts of clean energy taken from the grid during off-peak hours. The batteries would support almost 75 percent of Quayside peak load⁸⁴ — reducing the use of grid power at costlier and more GHG-intensive peak times.

C Backup power.

Quayside buildings would have on-site backup generators, fueled by bio-diesel, to provide emergency services, such as elevators and hot water, for multiple days.

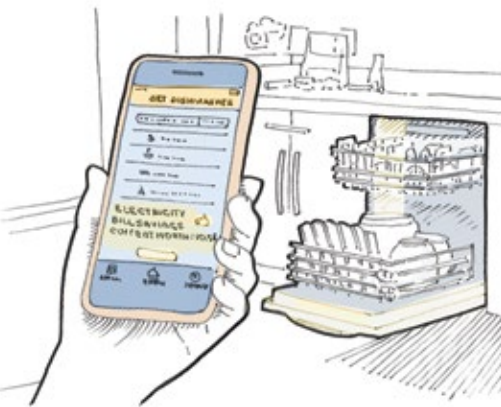
D Advanced power grid.

Sidewalk Labs has been working in collaboration with Toronto Hydro to design an advanced power grid that would have two connections to the main Toronto electricity grid as its primary source of power, supplemented by local solar generation and battery storage. The advanced power grid is designed with the ability to disconnect from the larger grid (“islanding”) through switching and connections, so that on-site energy resources could be fully used during a larger grid outage. It is also designed with enhanced distributed energy management visibility, control, and coordination into the neighbourhood resources (often called “behind the meter” insight) through a distributed energy resource management system to enhance demand management functionality and grid reliability. Even when disconnected, the Quayside grid would remain under Toronto Hydro control and management.



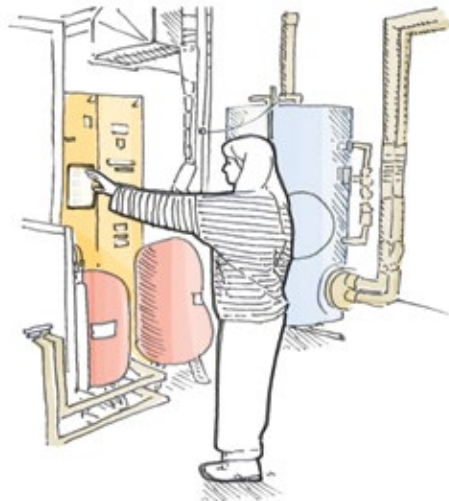
Office Scheduler

A proposed digital Office Scheduler tool is designed to help commercial tenants manage their energy use and costs by optimizing all the systems under their control. For instance, these Schedulers could automatically adjust the interior temperature based on occupancy, and could also point workers to warmer and cooler areas in their office, depending on their preferences.



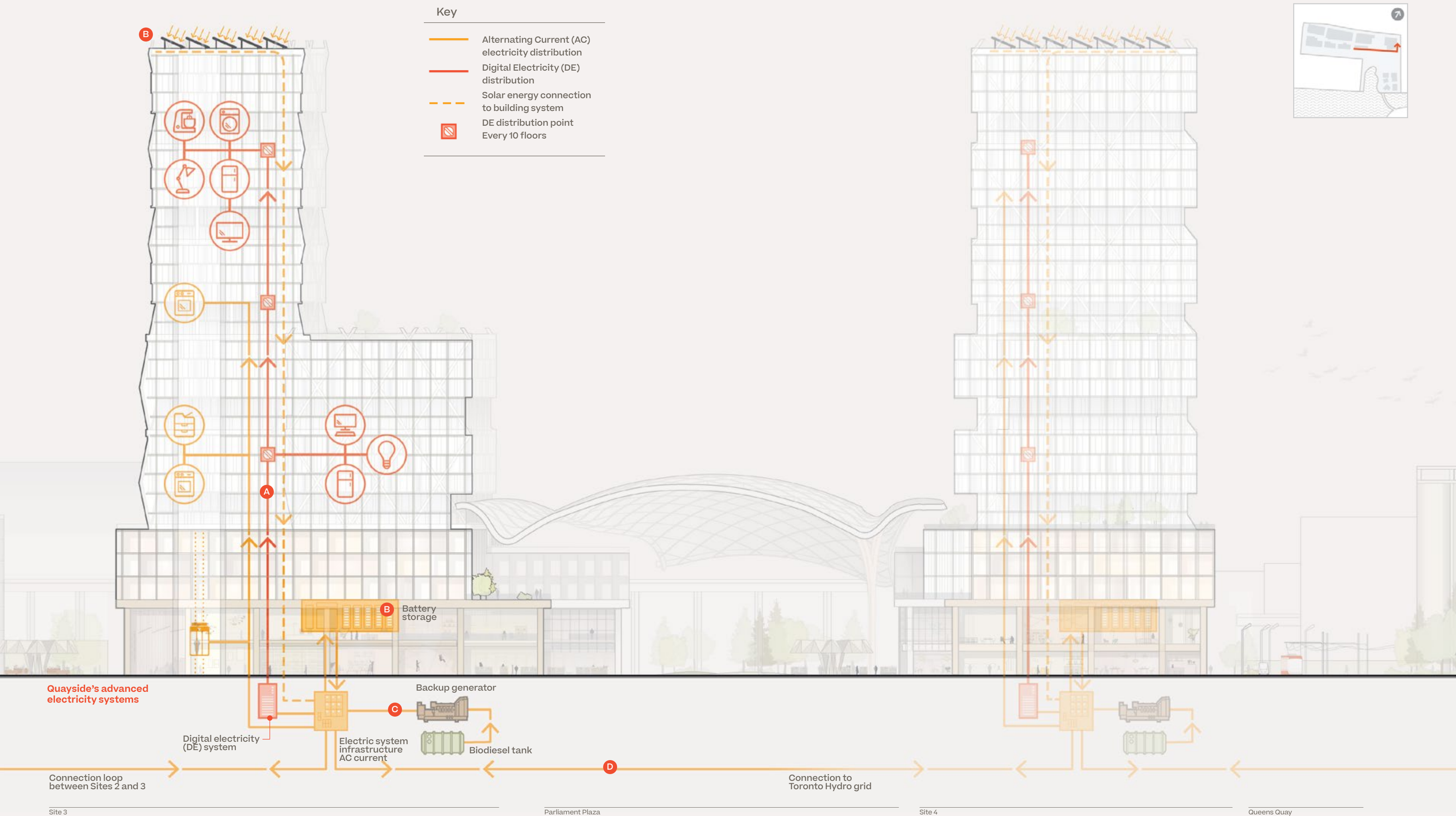
Home Scheduler

A digital Home Scheduler tool would help residents manage energy use and utility bills in Quayside. This Scheduler can automate devices such as dishwashers to run during off-peak hours, when energy is cleaner and cheaper. (Residents can always override these settings if they wish and pay peak-hour utility prices.)



Building Operator Scheduler

Building operators make dozens of daily decisions about how to manage the centralized heating, cooling, lighting, and electric systems in buildings. The Building Operator Scheduler can help optimize core building energy systems, freeing up managers to focus on things that require more personal attention, like preventive maintenance.



Creating a smart waste system



The Quayside plan features a series of technological, policy, and infrastructure advances to exceed Toronto's goals for landfill diversion and demonstrate an innovative path forward for neighbourhood waste.

Despite a citywide waste reduction target of diverting 70 percent of recyclables and organics from landfill waste by 2026,⁸⁵ multifamily buildings in Toronto currently divert only 27 percent;⁸⁶ commercial buildings are worse, diverting only 13 to 18 percent.⁸⁷ This outcome has major climate impacts: food waste that ends up in a landfill produces methane, a greenhouse gas 25 times more potent than carbon dioxide.⁸⁸

Quayside can achieve a landfill diversion rate of 80 percent⁸⁹ by providing real-time feedback on common recycling mistakes, using smart chutes to separate waste and institute a “pay-as-you-throw” system to reduce waste, which has proven effective in single-family homes, and conveying waste to a centralized location through underground tubes to reduce contamination.

1 Smart collection.

Refuse rooms on every floor would be equipped with three separate disposal chutes: organics, recyclables, and landfill.

2 Pay-as-you-throw.

Smart chutes for each waste type could be unlocked from an app or a touch screen to charge tenants for what they deposit, creating an incentive to throw away less trash. Sensors would measure volume and weight.

3 Waste transfer.

In the basement, waste would connect to an underground pneumatic tube system designed to handle almost 1.5 tonnes a day, and move waste at speeds of up to 70 km/h⁹⁰ to the neighbourhood's collection point: Terminal Station. Sensors would release only one type of waste stream at a time, eliminating cross-contamination.

4 Outdoor waste disposal.

Disposal chutes in strategic public locations would be tied directly into the pneumatic system, and in other locations, deployable smart bins would send alerts to maintenance staff when they are ready to be emptied.

5 Special waste.

Oversized and speciality items that cannot go through the waste tubes (like paint and recyclable cardboard) would be transported through the underground freight tunnel system to Terminal Station.

6 Terminal Station.

Terminal Station is planned to be co-located at Site 1 with the Quayside logistics hub, integrating freight and waste management. A crane system would hoist full airtight dumpster-sized containers onto garbage trucks for removal and replace empty containers.

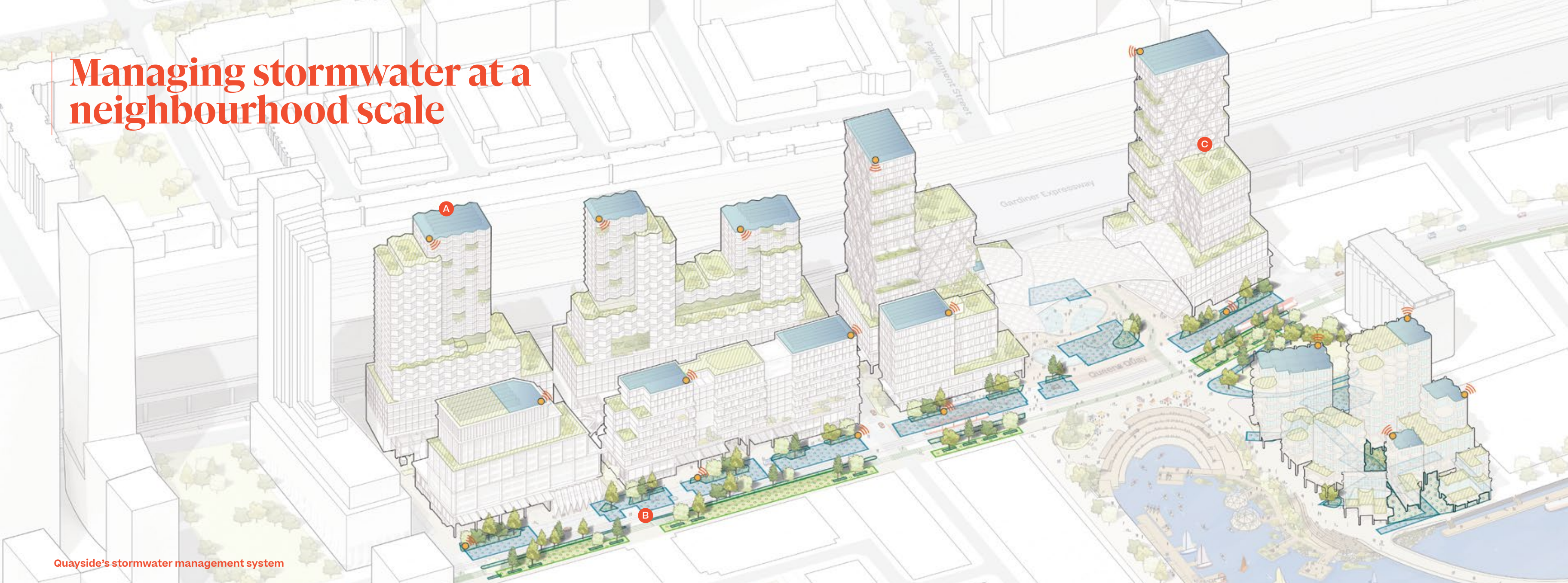
7 Off-site disposal.

Trucks would transport the waste to three locations for disposal. Organic materials would be taken to one of Toronto's world-class anaerobic digestion facilities, such as Disco Road.⁹¹ Recyclables would be brought to one of Toronto's material recovery facilities, in which glass, metal, paper, and other materials are sorted and processed for sale on a secondary market. Other materials would be taken to Green Lane landfill.

8 Feedback loop.

Sidewalk Labs proposes to collaborate with material recovery facilities to track contamination in the recycled waste stream via computer vision software. The results would be displayed on smart screens in building refuse rooms to provide feedback on the most common recycling errors and contamination rates, helping tenants recycle more effectively. Over time, cleaner waste streams would reduce waste disposal costs for residents and businesses.

Managing stormwater at a neighbourhood scale



Quayside's stormwater management system

Quayside's holistic and active approach to stormwater management would integrate technology and green infrastructure to create a neighbourhood-wide system that is more effective, sustainable, and beautiful than typical developments.

In the face of climate change, cities must prepare for the impact of increased storm intensities. For example, Waterfront Toronto's vital \$1.25 billion flood-mitigation project will help protect the eastern waterfront from flooding during heavy rains.⁹² The Quayside plan builds on such efforts with a neighbourhood-wide stormwater management system

that features two core components: "green" infrastructure and active management capabilities.

Developments typically manage stormwater by using large-scale "grey" stormwater infrastructure, such as concrete or plastic tanks, to capture stormwater for detention. Mechanical treatment centres then filter it for pollutants. These costly facilities are single-purpose and take up valuable space that could be used for the public realm or other development uses.

In Quayside, a coordinated network of green infrastructure, such as street plantings and green roofs, would help retain stormwater and filter it

in natural ways. To complement this infrastructure, digital tools would empty stormwater tanks or cisterns in advance of storms, minimizing grey infrastructure needs and improving resilience. The same tools could also monitor the operational health of the system — from plants to pipes.

At opening, this integrated system would meet or exceed Toronto Green Standard Tier 3 retention requirements (25 millimetres) for every rain event, resulting in on-site management of at least 90 percent of the water that would typically end up entering the municipal system.⁹³ This approach also contributes to a greener, healthier public realm.

A Active management.

Quayside's active stormwater management system consists of environmental sensors (described on the following page) that would manage blue roof cisterns on all buildings and one large underground tank at Site 1. The system would empty tanks in advance of storms to maximize storage capacity and use water for site irrigation.

B Green infrastructure.

The Quayside plan uses landscaping and green infrastructure as a first layer of stormwater management, to naturally retain and filter rainwater. This network includes tree plantings and bio-retention zones (described in more detail on the next page) that help retain stormwater in spaces beneath the sidewalk, where it can irrigate the plantings or evaporate without needing treatment.

C Green roofs.

The Quayside plan uses a combination of photovoltaic cells (installed over the blue roof areas) and green roofs to adhere to the Toronto Green Roof Bylaw.⁹⁴

- Blue roof 80%
- Green roof 30-50%
- Bio-retention High infiltration
- Bio-retention Low or no infiltration
- Active control and monitoring sensors

Designing a green, active stormwater system

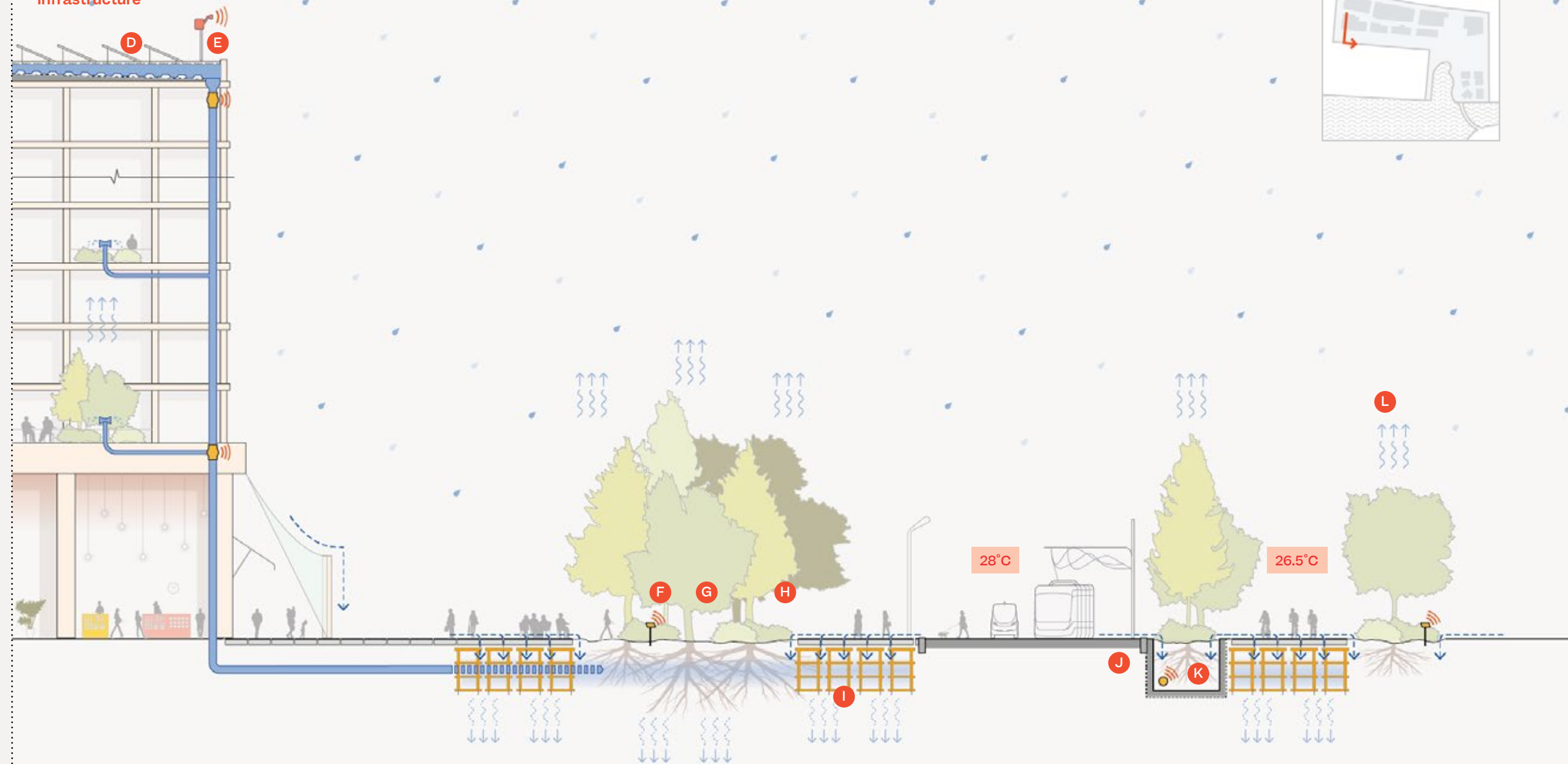
Conventional development



Compared to business-as-usual stormwater design, which uses large underground tanks and pipes, Quayside's lush public landscape is designed to act as a robust stormwater management system. Digital tools would help handle excess stormwater by proactively emptying storage tanks before a storm.

- A Stormwater drains.** Rain flows directly from the street into underground pipes and must be treated by large-scale municipal facilities. In heavy rains, the system can be overloaded, leading to flooding.
- B Standard street trees.** Most street tree-planting areas are not specifically designed for water infiltration, treatment, and conveyance.
- C Grey infrastructure tanks.** Tanks and pipes in traditional developments are expensive and must be sized for maximum detention, leaving them underutilized in good weather. These systems are also passive, in that they are unable to respond to anticipated storm events.

Quayside's stormwater infrastructure



Site 1 South

Queens Quay

- D Blue roof.** The water captured by blue roof systems would be used to irrigate rooftop gardens and other plantings within the building, or conveyed to green infrastructure areas for controlled site irrigation.
- E Rainfall gauge and weather station.** A proposed active stormwater management system would use real-time weather data to identify potential rain events. Control valves for rooftop and underground cisterns would automatically empty tanks to maximize storage capacity in advance of storms, helping to reduce flooding.

- F Agriculture sensors.** Agriculture sensors typically used in farming, including moisture sensors and infrared technology used to measure nitrogen and salinity levels, would be piloted to track and maintain ecological health.
- G Bio-retention zone.** Extensive planted areas throughout the site would reduce the flow of stormwater into the municipal system while irrigating plants and prefiltering the water. Permeable pavers used extensively around these planted areas would filter surface runoff and prevent inundation, and soil cell infrastructure underground would allow for extensive root growth.

- H Plant diversity.** A diverse selection of plantings would be designed to collectively maximize root growth and water absorption, resist street salt, and demonstrate phytoremediation (or contaminant abatement) abilities.
- I Pavers and soil cells.** Permeable pavers used extensively around planted areas would filter surface runoff and prevent inundation, and soil cell infrastructure underground would allow for extensive root growth.
- J Flow-monitor and water-quality sensors.** Stormwater sensors would measure water quality and reduce

- K Contamination control.** In areas with more contaminated soil, such as the south side of Queens Quay, green infrastructure like soil cells would use impermeable bottom liners to keep polluted water from entering the system.
- L Heat island effect.** Trees and plantings would reduce the heat island effect by shading streets, releasing moisture to cool the environment, and providing natural wind mitigation.⁹⁵

operational issues by tracking water flows and identifying block-ages in the system.

Social Infrastructure



Provide the health, civic life, learning, and workforce initiatives and facilities that enable everyone to thrive.

Building towards a complete community

The Quayside plan would integrate space for social infrastructure from the start, creating opportunities for community organizations and local service providers to activate these spaces, strengthen the community, and help community members thrive.

Whatever its form — library, online forum, health centre, weekly meetup — social infrastructure fosters health and well-being, ties together communities, and helps people reach their highest potential.

While Sidewalk Labs would not provide any community services, to build towards a complete community in Quayside it proposes allocating 90,000 square feet towards social infrastructure as well as supporting local community organizations and service providers with expertise, digital prototypes, resources, and planning to bring innovative service delivery models to the community. Sidewalk Labs would also work with partners to ensure that critical services are accessible to all populations, including the most vulnerable, and that Sidewalk Labs' commitments to diversity, equity, and inclusion are sustained.

While social infrastructure cuts across a wide range of disciplines, Sidewalk Labs has chosen to focus on social infrastructure spaces and programs that relate to health and community services, civic life, and learning, as a starting point to show what could be possible in this unique site.

Sidewalk Labs' contribution to **health and well-being** has two core components. One is a development plan that encourages healthy living and community well-being. Another is a physical hub called the Care Collective dedicated to enhancing health and well-being by co-locating health care and community services alongside proactive health programming. Upon approval of the MIDP, Sidewalk Labs plans to seek a local partner to convene health care and community service providers; working together with the community, this group could explore opportunities to provide proactive, integrated, digitally enabled, and holistic service delivery offerings.

Sidewalk Labs' contribution to **civic engagement** is anchored by a physical hub called the Civic Assembly, a place for gathering, learning, and engaging amongst the community. To complement the physical space, fully accessible digital tools — both those already existing in the market and others created in partnership with the community — could help people to participate in civic life, collaborate, and shape their neighbourhood and help governing bodies to undertake more transparent, inclusive, and responsive decision-making.

Sidewalk Labs' contribution to **learning** provides opportunities to push the boundaries outside the four walls of the classroom. It begins with an elementary school (proposed to be operated by the Toronto District School Board) and a collaboration with the Toronto Public Library to further expand the reach of its programming throughout the community.

In addition to the planning of physical spaces and partner-led programs, the conditions for innovation established throughout Quayside create unique opportunities for social infrastructure. For example, educational programming could pop up in Quayside's flexible spaces; organizations could explore new digital tools, with the confidence that all community members will have access to digital supports; and a community service provider could explore the implementation of a new operating model.

These contributions should evolve through the leadership and ownership of local partners and institutions — hopefully, resulting in a network of diverse and inclusive social infrastructure spaces, digital complements, and services that will continue to respond to a wide, inclusive range of community needs.

Prototype spotlight

Engaging the community in local decisions

Together with local communities and Digital Public Square, a non-profit spun-out of the University of Toronto, Sidewalk Labs prototyped a new digital tool in early 2019 called Collab.

This online resource engages community members in local decisions that can shape their neighbourhood, such as programming in a central public space, through a transparent process that reveals the decision-making framework and all community inputs. Users propose their choices for events in their community, and then the tool walks them through the trade-offs associated with each proposal — a farmers market provides fresh produce and draws a lot of foot traffic, but the space may feel too congested for a community picnic — and how their individual choices impact the community.

The Collab prototype has a publicly available Responsible Data Use Assessment. For use in Quayside, Collab would need to be approved by the proposed Urban Data Trust and would abide by all Canadian laws and the Responsible Data Use Guidelines for the Sidewalk Toronto project. The prototype is available to try at collab.sidewalklabs.com.

With new and existing technologies like these serving as easy entryways to engagement, everyone in the community could be activated to shape the Quayside neighbourhood.

Designing a healthy place

The Quayside plan will be developed through a health and well-being lens; in this way, the neighbourhood would encourage and enable healthy living.

Research has found that 60 to 80 percent of a person's long-term health outcomes are determined not by access to quality care, or even genetics, but by environmental conditions, social circumstances, and individual lifestyles and behaviors.⁹⁶ To enable all people to live well, these “social determinants of health,” defined by the World Health Organization as “the conditions in which people are born, grow, live, work and age,” must be addressed. One way to do this is through planning and design.

Since the mid-20th century, many cities have been developed in ways that undermine people's abilities to lead healthy

lives. Too many people spend too much time commuting in cars and sitting all day in offices and spend too little time being active, outdoors, or interacting with people face-to-face — all risk factors for poor health and, in particular, preventable chronic diseases.

Designing for good health should be a key planning principle. To help guide the development of Quayside, Sidewalk Labs plans to use The Community Wellbeing Framework, developed by the Conference Board of Canada and the design firm DIALOG in 2018, which provides useful, evidence-based guidance for developers, urban planners, and architects to apply a health and well-being lens to their work.⁹⁷

The Quayside plan incorporates a range of strategies to create a healthier neighbourhood for all, including mass timber buildings, abundant open and green spaces, and a lively mix of community spaces.



Supporting a mix of uses

Quayside's development program calls for 67 percent of space to be devoted to housing, with roughly 33 percent devoted to office, retail, community, and maker spaces, as well as other non-residential uses. This approach to creating a dense, walkable, mixed-use neighbourhood can enable increased physical activity and enhanced social well-being.

Promoting active transportation

Safe and accessible cycling and pedestrian infrastructure can lead to increased physical activity. Sidewalk Labs plans to deploy heated pavement in bike lanes to make cycling more attractive all year and in some sidewalks to reduce falls and injuries.

Providing abundant green space

The Quayside plan provides accessible green spaces throughout the neighbourhood, helping to bring people together as well as to reduce levels of stress, depression, and anxiety. Sidewalk Labs' proposed outdoor comfort systems would also make outdoor spaces comfortable for 35 percent more hours throughout the year, compared with conventional development.

Encouraging social interaction

Formal and informal community spaces, activated with community-led programming, are designed to draw in diverse groups of people, enhance cohesion, and reduce isolation. Locating community spaces alongside spaces for the delivery of health care and community services can make interactions with service providers part of day-to-day life.

Designing healthy buildings

Buildings that embody biophilic design principles, optimize for natural light, use healthy materials (such as mass timber), and ensure indoor air quality can ensure that residents, visitors, and workers have healthy indoor environments.

Providing ubiquitous connectivity

Affordable, high-speed Wi-Fi, as well as access to digital support, would enable providers to extend support beyond the clinic via virtual care and digital health management tools.

Care Collective: Enabling health, well-being, and access to holistic care

The Quayside plan sets aside a central space, called the Care Collective, which would be dedicated to enhancing health and well-being by co-locating health care and community services alongside proactive health programming, and would be activated by local partners. If these partners choose, the Care Collective could demonstrate a forward-looking model of integrated local health programming and health care and community service delivery.

The city’s Downtown Plan recognizes a need to plan for more affordable, accessible, and appropriate spaces for delivering community services in downtown Toronto; what’s more, enhanced coordination in planning and delivering health care and community services, especially in parts of the city that are growing rapidly, has also been recognized as an urgent need.⁹⁸ The Care Collective is envisioned as a convenient place for community members to not only access both health care and community services but to receive proactive support so they can lead healthier lives and better care for themselves.

Helping people to remain healthy requires an increased focus on prevention and early intervention, alongside the delivery of more integrated health care and community services.

In Quayside, Sidewalk Labs plans to be a catalyst when it comes to promoting health, not a direct service delivery provider. In this role, Sidewalk Labs proposes providing a space, called the Care Collective, for the co-location of preventive support, health care, and community services as well as offering leases at below-market rates to ensure a diverse set of service providers, including non-profit organizations.

Local service providers would be invited to work together to activate the space and coordinate services to provide residents, workers, and visitors with responsive, community-based care.

The Care Collective would be located adjacent to a number of community spaces, including the Civic Assembly (see Page 224) as well as amenities (such as cafés, gyms, or health-related shops) that make it an essential community resource — a place for people to go not just when unwell, but to spend time and seek proactive support.

To envision what kinds of spaces could respond to the emerging health and well-being needs of future populations, Sidewalk Labs commissioned Toronto-based design studio Idea Couture to undertake preliminary concept work for a people-centred design of the space.⁹⁹

A plan for the Care Collective, and a vision for how health care and community services could be delivered in Quayside, must be led by local stakeholders and should build on the lessons learned from existing models.

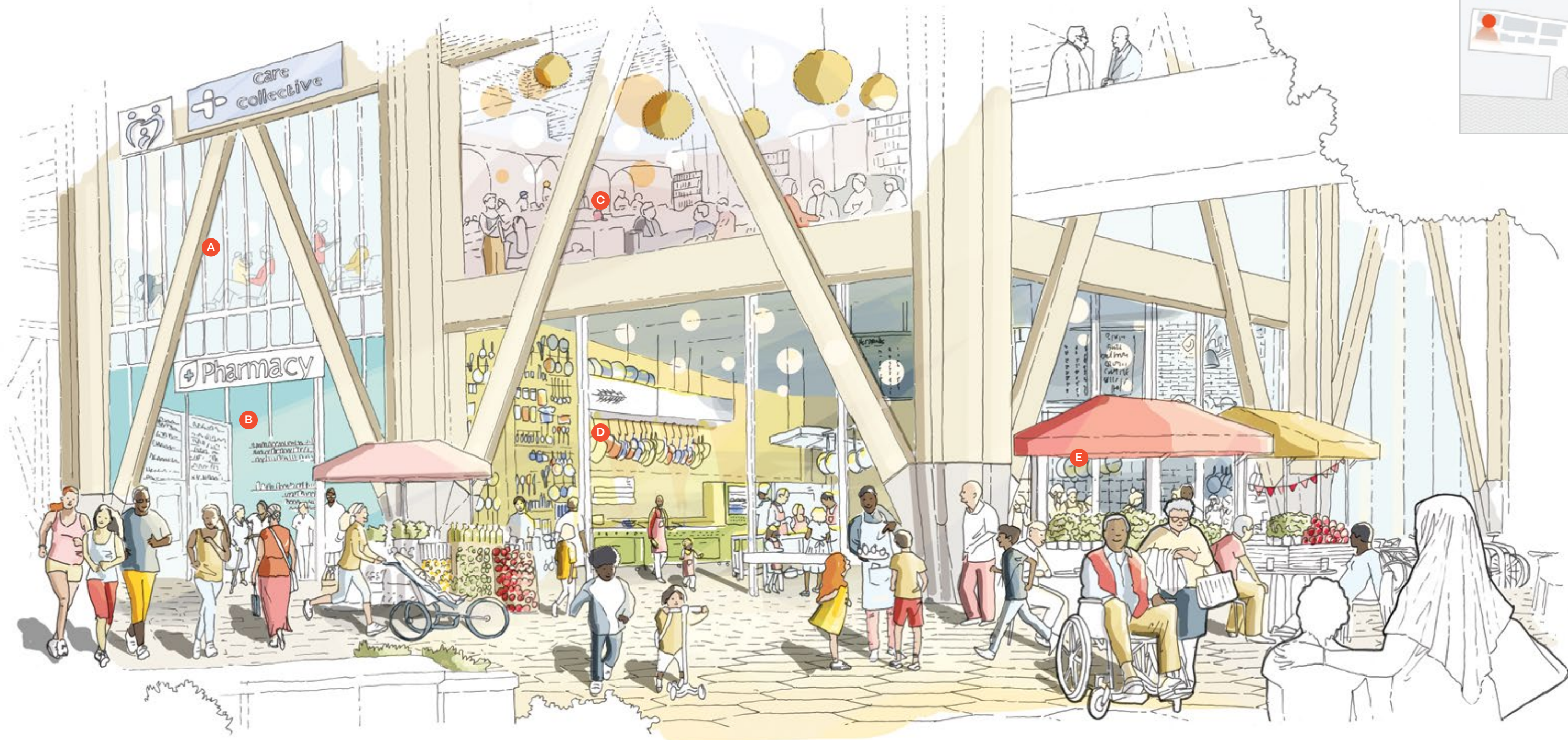
For example, recognizing growing health and equity gaps across the city, United Way Greater Toronto has supported the development of community hubs in underserved neighbourhoods, each a “one-stop-shop” that makes a range of services and programs available under one roof.¹⁰⁰ This model and others, such as family health teams and community health centres, are compelling examples of

operating models that seek to better coordinate services through co-location, respond to community needs, and treat people holistically through team-based care.

As governments and health care providers work to address the social determinants of health, and as care increasingly shifts from acute to community-based (and virtual) settings, new models of community care in new types of community spaces will be required in every neighbourhood.

If the MIDP is approved, a leading entity or entities (not Sidewalk Labs) could convene health care and community service providers and the community to co-create a proposal for the operations of the Care Collective. If desired by this group, the Care Collective could demonstrate a forward-looking model of integrated local health promotion and care delivery. This model could provide continuous disease prevention and management support as well as integrated community-based care, leverage emerging digital solutions and virtual care to enhance access, and reduce health inequities to improve health outcomes for all.

Sidewalk Labs proposes contributing resources to support the development of a proposal for the Care Collective. If desired, Sidewalk Labs would offer its expertise, including support on technical roadmaps for new or existing digital tools that could meaningfully improve outcomes, efficiency, and experience.



A Spaces for service delivery. Spaces for the delivery of health care and community services, including consult rooms, meeting rooms, and flexible multi-purpose spaces. Virtual consult rooms, which would be stocked with diagnostic tools and staffed with in-person technical support, could enable virtual care with specialized providers that aren't located in the Care Collective.

B Spaces for health-related retail. Retail spaces with a health and well-being focus, such as a pharmacy or fitness club, could be located near the Care Collective.

C Space to enhance health literacy. A health resource centre where visitors could test, learn about, and borrow a range of curated digital health tools and apps recommended by care providers. Staff in this centre could guide visitors to helpful resources in their

community and lead educational programming focused on health literacy, digital health, and self-care.

D Space to support healthy, communal eating. A community kitchen and dining space for use by residents, community organizations, and pop-ups could teach healthy cooking and eating skills while also providing space for communal dining to bring people together.

E Spaces to support well-being. Dedicated sanctuary space could help people to maintain their mental well-being by providing a place to relax, relieve stress, and unplug in a quiet, nature-infused environment. These spaces could support social prescribing (for example, a doctor could prescribe time in the sanctuary space).

Civic Assembly: Creating a connected community that is civically engaged

The Quayside plan sets aside a central space to connect with neighbours, learn about what is going on in and around the neighbourhood, share ideas, debate, engage in cultural activities, stay abreast of the newest digital tools, access local services, and participate in community decisions. This Civic Assembly would be the physical heart of civic life in Quayside.

It can be hard in the rush of urban life for community members to meet each other and connect, let alone to join in the shared project of shaping their neighbourhood. In the words of a Sidewalk Toronto Reference Panel resident: “A big part of social capital is the accident of bumping into people you know, and having unplanned conversations. It’s that magical pixie dust that happens between people when we are out together.”

The Quayside plan allocates space for both the Civic Assembly and the Care Collective in a prime location that spans Sites 1 and 2 (the first phase of

development). This space has direct access to Queens Quay and an animated pedestrian corridor, and is adjacent to housing and office space. This location would enable the Civic Assembly to draw off the energy of local street life, enhancing the likelihood of serendipitous connections and becoming a vibrant daily gathering place that brings people together and activates the community.

Community members and organizations could book space in the Civic Assembly for meetings or gatherings. Located in an adaptable stoa space, the assembly could evolve according to the

community’s needs and interests: one day, a stay-at-home dad could host a book club there; the next, a senior could teach a giant knitting class; or, throughout one summer, an emerging artist could lead a projection-mapping workshop.

Sidewalk Labs has started to prototype many of the ideas that could be present in the assembly — including innovative arts programming and tech demonstrations — in its collaborative workspace, 307, and will continue to pilot ideas leading up to the development of the Sidewalk Toronto project. However, Sidewalk Labs would not operate this space alone; Sidewalk Labs plans to convene and contribute resources to support local stakeholders to develop a proposed plan for the program and operations of the Civic Assembly, offering an opportunity for many organizations from across the city to shape this central gathering space with the community as it grows.

The Civic Assembly would become a central hub for community, arts, and cultural gatherings and could evolve to meet neighbourhood needs.

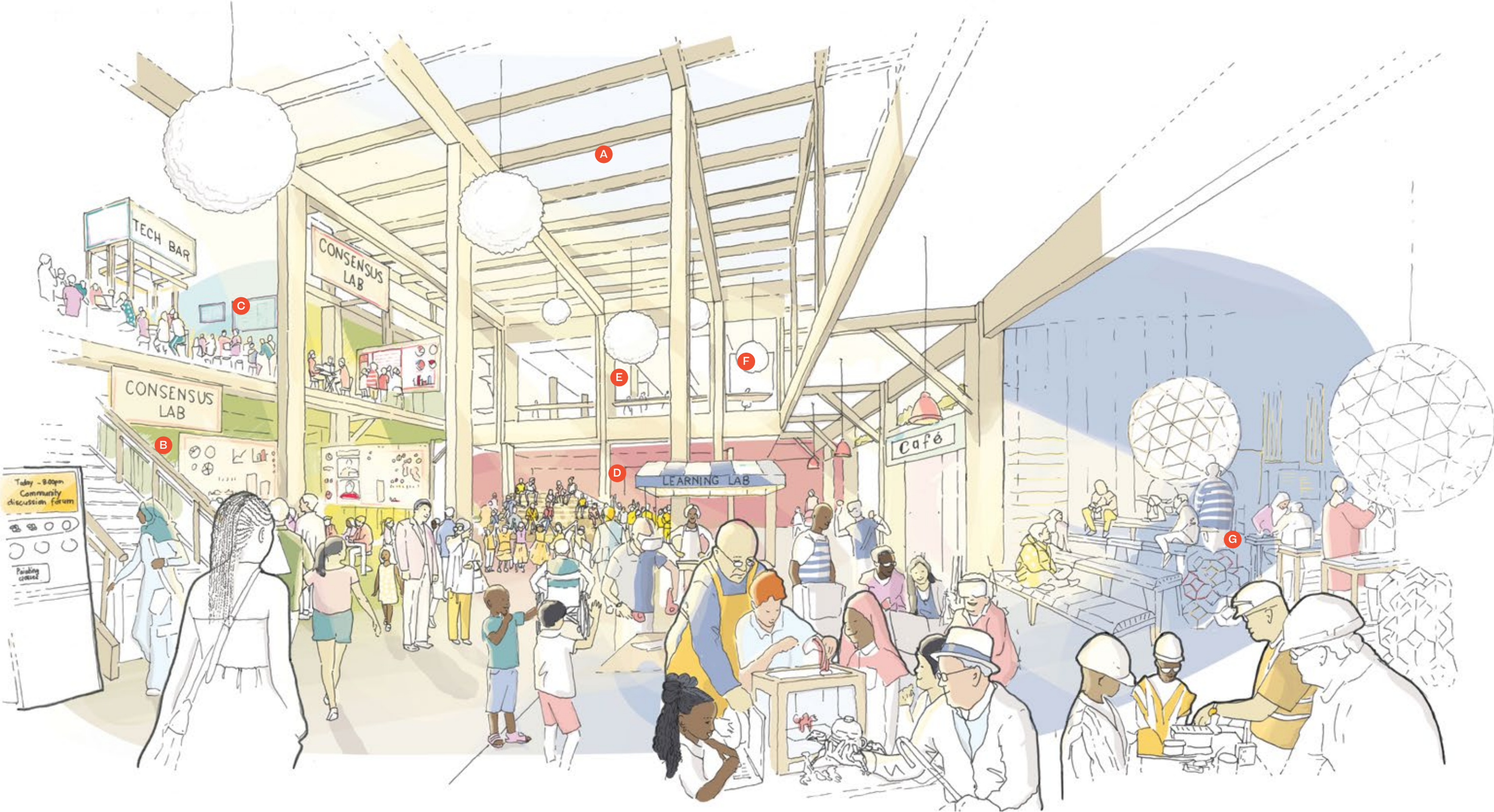
Digital spotlight

Activating civic life in Quayside

In Quayside, community members could attend neighbourhood meetings or provide input by visiting the Civic Assembly. With inclusive access to Wi-Fi and digital support, all community members could also use digital tools designed for participation, collaboration, and influence, helping residents as well as those who visit or work in Quayside to have a greater sense of ownership and belonging in the community.

Community organizations and governing bodies could also choose to leverage these technologies to help them engage with a diverse range of community members and use that community feedback to inform their decision-making processes. While Sidewalk Labs would not operate any of these bodies, it has secured the support of Toronto-based non-profit Digital Public Square to convene a panel of community members and experts that would advise on the creation of a Quayside Neighbourhood Association and offer insight into opportunities for new tools and spaces as well as processes for transparent decision-making.

When combined with Quayside’s flexible spaces that community members can adapt to meet their needs, and plentiful civic and gathering spaces that bring people together, these responsive governing bodies and convenient digital tools could activate the Quayside community to participate, enabling a strong, inclusive, and vibrant community.



A Community Central.
This flexible central atrium could draw and accommodate hundreds of people day and night and could feature digital displays that announce upcoming events and activities, new community ideas and participation opportunities, and environmental conditions.

B Consensus Labs.
This space could allow community members to explore the latest community initiatives, weigh in on a pending issue, contribute their ideas, or vote for community projects using large screens and touch tables that visualize initiatives and facilitate conversation.

C Tech Bar.
This space — staffed by digital experts who know the ins and outs of all of the technology in the neighbourhood — would allow community members to access support for any of their digital needs. Leaders in the field, such as the Toronto Public Library, could offer free digital and data literacy classes, as well as host open hours to facilitate input on digital tools and new use cases.

D Pop-up Learning Lab.
In this space, community members could use new technologies, such as robotics and 3D printers, computer workstations, or audio and video equipment to participate, learn, connect, and create online.

E Flexible bookable spaces.
These spaces would enable the community to connect, discuss ideas, build consensus, and participate in civic discourse, with breakout rooms for committees and smaller events as well as flexible spaces for government and non-profit programming.

F Office spaces.
Organizations, such as the Quayside Neighbourhood Association or the Open Space Alliance could reside in the Civic Assembly to easily reach the community.

G Arts and culture areas.
These spaces would include shared fabrication equipment and tools (such as laser cutters and wood-working machines) and have the flexibility to be carved into smaller studio spaces.



Elementary school: Making the community a classroom

Sidewalk Labs plans to work with the Toronto District School Board (TDSB) and the Ontario Ministry of Education to ensure that neighbourhood families in and around Quayside have access to a best-in-class school located near complementary services from the start.

To accommodate projected population growth in the eastern waterfront, the TDSB has proposed to locate a new school in East Bayfront / North Keating.¹⁰¹

To help accelerate this development, Sidewalk Labs proposes to work with the TDSB to plan up to 60,000 square feet on the lower floors of a mixed-use building for an elementary school for up to 600 students spanning grades pre-K through 8. A portion of the ground floor space of the school site could also be allocated for a child-care facility.

The TDSB would operate the school, which could support the short- to mid-term needs of this growing population.

Collaborating with TPL to expand community programming.

Planning Quayside around flexible spaces and high-speed connectivity enables lessons, after-school programs, and other learning opportunities to expand outside the classroom — in community spaces or even in the public realm.

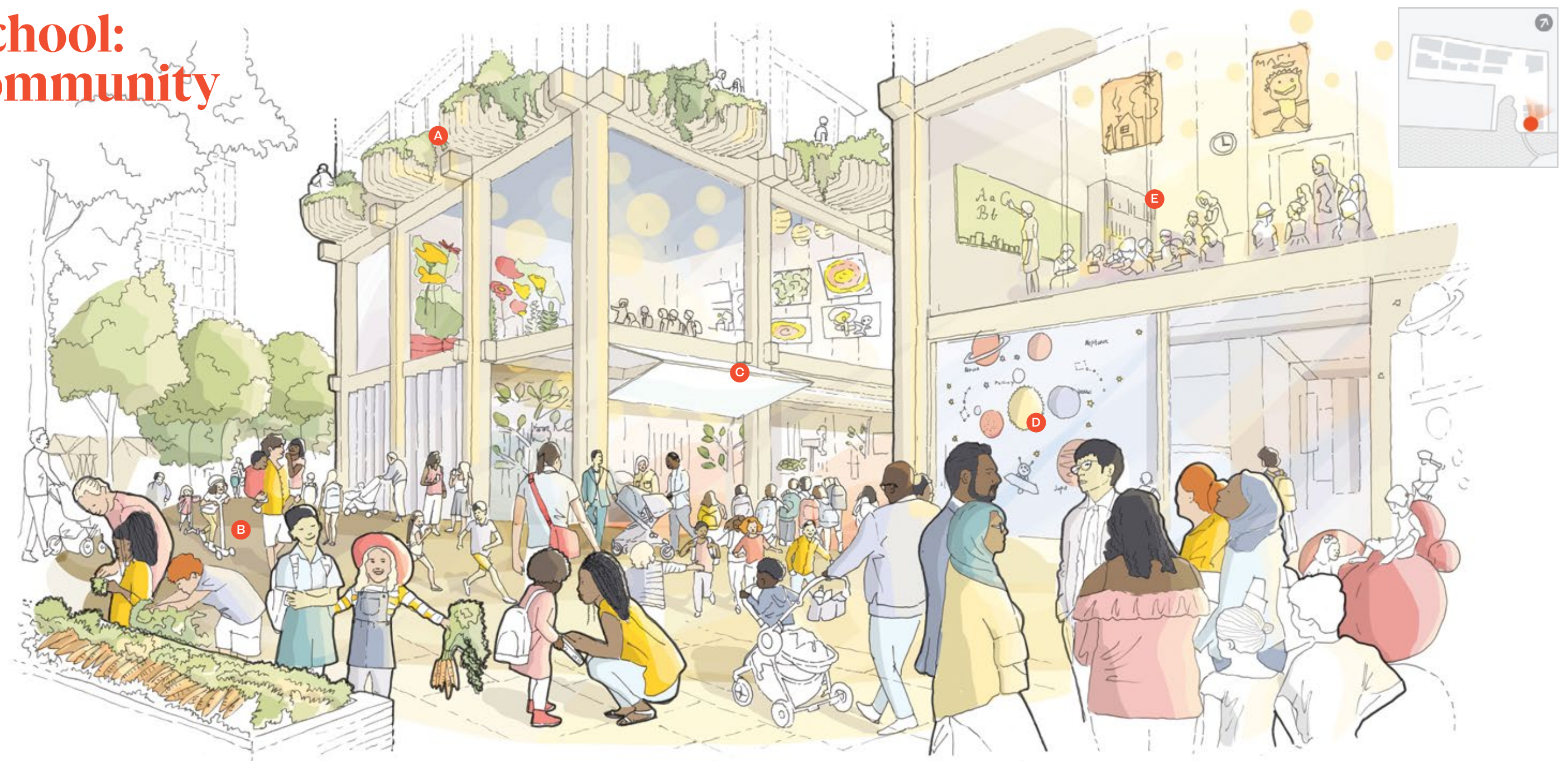
To begin activating opportunities for learning throughout the community, Sidewalk Labs is pursuing collaborations with educational leaders in Toronto. Sidewalk Labs and the

Toronto Public Library (TPL) are currently exploring opportunities to seamlessly integrate the library's presence throughout Quayside, building on the theme of learning happening everywhere.

These opportunities could include pop-up learning labs or lending services; TPL-developed classes, particularly those that support data, AI, and algorithmic literacy; or digital consult rooms in library branches or

pop-up library stations that could allow residents to easily book a private session or meeting with service providers.

Sidewalk Labs also proposes supporting TPL's Innovator in Residence program and working with TPL, employers, and other institutions, such as George Brown College, to explore the development of new training pathways.



A Mixed-use location.

Locating the school in a mixed-use, flexible building would lower up-front capital and operating costs and provide the ability to adapt to dynamic community needs.

B Proximity to open space.

Locating the school in proximity to vibrant open space, Silo Park and Parliament Slip, would allow students to learn from real-world situations. The waterfront could offer a living laboratory for a biology lesson, for example. Or teachers could create opportunities for students

to learn from community members, say by visiting an artist's studio in the Civic Assembly to gain exposure to new materials and techniques.

C Adaptable classroom spaces.

Classrooms with modular furniture and movable walls would allow educators to test new models of learning, such as a “flipped classroom,” where students consume lectures outside the classroom and participate in one-on-one and group work in the classroom.

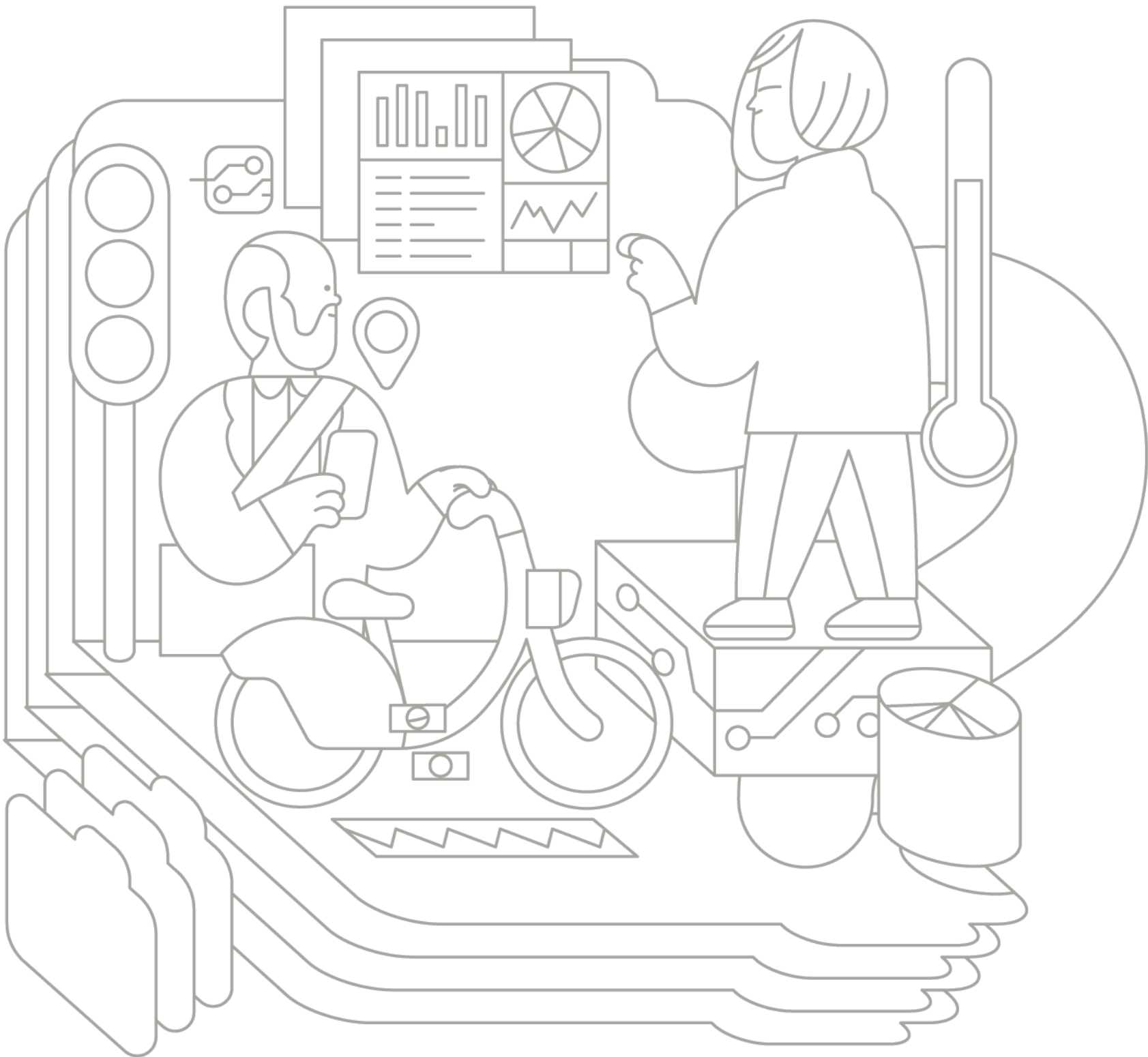
D Common social spaces.

Common spaces outside the school would allow for gathering, lingering, and socializing for members of the school and the larger community, helping to build relationships and connections.

E Proximity to community services.

A school location near housing and complementary community services — such as primary health-care and childcare — would provide convenient access, save households time, and ensure students' and parents' holistic needs are met.

Digital Innovation



Catalyze digital innovations that help tackle urban challenges and establish a new standard for the responsible collection and use of data in cities.



See the “Digital Innovation” chapter of Volume 2 for more details on the urban innovations described in this section.

Creating the conditions for digital innovation

Quayside represents an important first step towards showing an innovative path forward on digital governance — demonstrating that cities do not need to sacrifice their values of inclusion and privacy for economic opportunity in the digital age.

Key Term
Urban data
refers to information gathered in the city’s public realm, its publicly accessible spaces, and even some private buildings.

The ability to create the conditions for digital innovation is at the heart of Sidewalk Labs’ vision for the city of the future.

Digital innovation is the basis for many of the core planning initiatives that Sidewalk Labs has proposed throughout this Quayside development plan to achieve Waterfront Toronto’s priority outcomes. It is also essential for catalyzing an ecosystem of new services and solutions by individuals, Canadian companies, local Toronto entrepreneurs, and other third parties from around the world.

But digital innovation raises a number of challenges that cities like Toronto are just starting to address. These challenges are especially complicated for “urban

data,” which Sidewalk Labs defines as information gathered in the city’s physical environment, including the public realm, publicly accessible spaces, and even some private buildings.

Toronto and Ontario have taken some important initial strides to advance the conversation around data governance principles. Sidewalk Labs proposes to build on that progress in Quayside by taking a holistic approach that creates four core conditions for digital innovation to flourish responsibly.

Providing more affordable and flexible digital infrastructure.
First, Sidewalk Labs proposes to establish open digital infrastructure that provides a shared foundation for using urban data to improve quality of life. That includes a powerful ubiquitous connectivity network that leverages new advances to improve speed and security. A standardized mount system would dramatically reduce the cost of deploying innovations and eliminate vendor lock-in.

Setting data standards that are open and secure.
Second, Sidewalk Labs proposes to outline clear standards that make data publicly accessible, secure, and resilient. Third parties depend on open hardware and software as well as on an agreed-upon set of standards and protocols to successfully deploy their ideas. A set of published standards around open-data architecture, access, and sources would enable third parties to build upon a shared foundation, supported by a common set of security, formatting, and communication standards.

Creating a trusted process for responsible data use.
Third, Sidewalk Labs proposes a trusted process for responsible data use that would apply to all parties (including Sidewalk Labs).

To meaningfully enable responsible data use across the IDEA District, Sidewalk Labs proposes that urban data be controlled by an independent entity called the Urban Data Trust, charged with balancing the interests of personal privacy, public interest, and innovation. This public steward would establish a clear process for approving any initiative that involved the use or collection of urban data for all parties, including those proposed by Sidewalk Labs.

This process would be anchored by a Responsible Data Use (RDU) Assessment — an in-depth review that is triggered by any proposal to collect or use urban data — and guided by a set of RDU Guidelines that incorporates globally recognized Privacy by Design principles.

Launching core digital services that others can build on.
Finally, Sidewalk Labs proposes to launch a minimal set of digital services that would catalyze this ecosystem of urban innovation. These services and applications remain essential to achieving Waterfront Toronto’s priority outcomes. Furthermore, the properly protected urban data generated by these launch services would be made publicly accessible, enabling companies, community members, and other third parties to use it as a foundation to build new tools.

The following pages describe how Sidewalk Labs plans to approach each of these conditions in Quayside.

Expanding opportunity with ubiquitous Wi-Fi

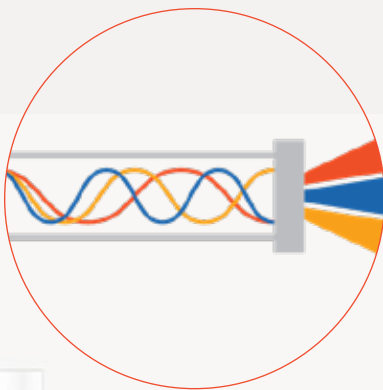
The waterfront currently incorporates world-leading internet speeds, thanks to the work of Waterfront Toronto and its telecommunications partners. Sidewalk Labs proposes to go even further by taking advantage of recent advances in fibre-optic technology.

Digital connectivity is what unlocks many of the innovations found in the Quayside plan. It is also the catalyst for new services or businesses and the cornerstone of a digital economy.

The Quayside plan would offer super-fast, super-secure Wi-Fi service that is accessible to residents and workers everywhere they go. Designed to span the entire neighbourhood, be upgraded easily, and minimize interference between devices, this network would always give users the highest speed possible.

This network would build on the work done to date along the waterfront to bring even more secure and reliable connectivity to all corners of the community, at all times.

Super-PON, super speed.
As part of its network planning, Sidewalk Labs is exploring a new technology called Super-PON (Passive Optical Network). By splitting lights into distinct wavelengths, Super-PON can support 768 users per fibre-optic strand, at least 12 times more than conventional systems, and extend fibre reach to 50 kilometres, at least 150 percent more than conventional systems.¹⁰² The result would be a network that provides increased speed over greater distances while requiring significantly less cable, equipment, and electricity.

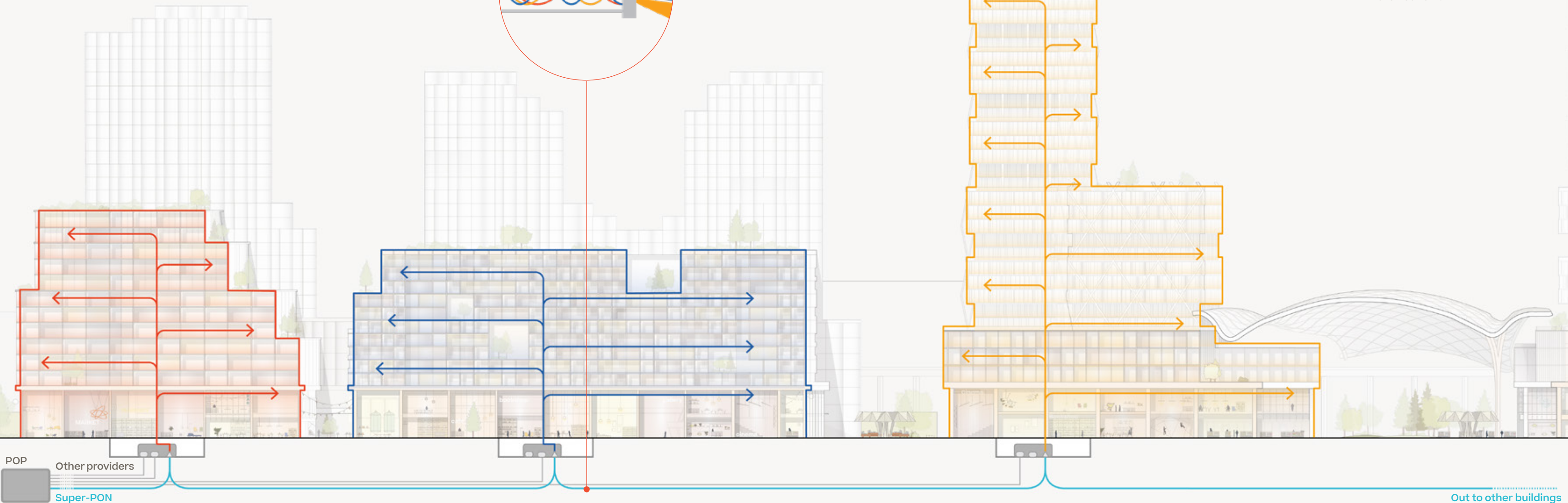


Buildings as networks.
Sidewalk Labs proposes that all buildings conform to a set of specifications that balance the goals of the Super-PON network with the ability for other providers to offer their own network services, including having three distinct points of entry; a “Meet Me Room” where all communications-related equipment would be installed; vertical risers dedicated to communications wiring accessible on each floor; horizontal risers connecting vertical risers to each unit; and Cat 6A wiring in each room for power-over-ethernet wireless access points.

Points of Presence.
The proposed design for a fibre-optic backbone would be connected to two major internet Points of Presence in downtown Toronto. Conduits holding the fibre would have express and local routes, as well as regular handholes (access points).

Wireless infrastructure.
Sidewalk Labs is working to determine the optimal location for Wi-Fi access points and antennas inside buildings and throughout the public realm in Quayside. This connectivity would ensure that many of the systems designed to improve life can operate seamlessly, from bike lanes that heat up using real-time weather information, to energy management systems that constantly optimize themselves, to accessibility beacons that help people navigate public spaces.

Personal, secure connectivity.
An emerging security approach known as a “software-defined network” can help people stay connected to their own personal home or office Wi-Fi network no matter where they are in Quayside, including parks and public spaces. These networks have advanced security capabilities; they are able to detect potential security risks aimed at connected devices and quickly disconnect an impacted device from the network.



Quayside’s advanced fibre-optic network

Reduce installation and maintenance costs with an “urban USB port”

A standard connection point for digital devices would drive down the cost of installing and maintaining digital hardware by 92 percent, making it easier for an array of third parties to develop new solutions to urban challenges.

Today, when cities (or their private-sector vendors) deploy devices that can collect data, the installation process creates significant disruption to street life and costs thousands of dollars, because light poles and other street fixtures were never designed to host digital hardware.

Adding a single car-counting device to an intersection requires the city to take the following steps:

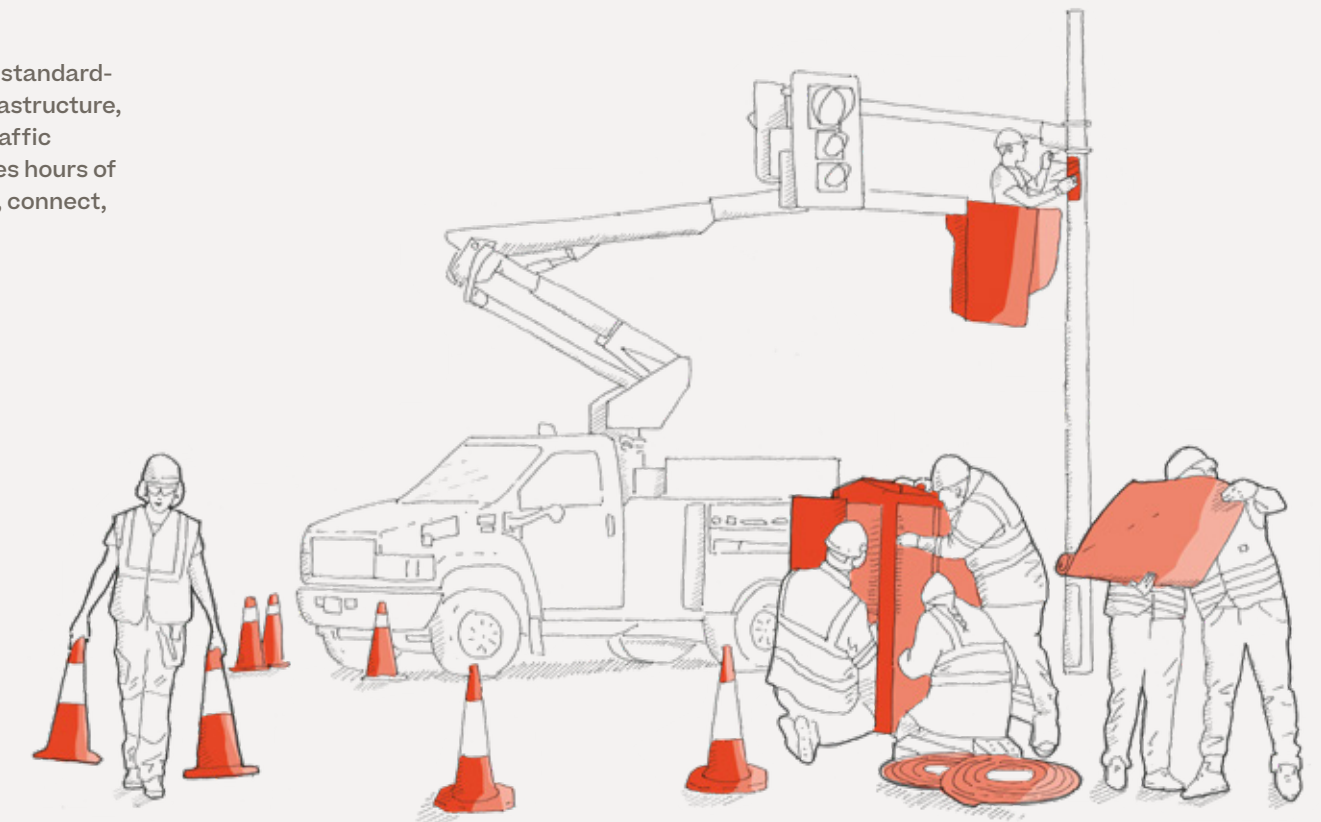
- **Shut down** a lane of traffic for hours or even days.
- **Send** a bucket truck with several staff to the intersection.
- **Devise** a creative mounting solution involving special clamps to adapt to the particular conditions of a traffic pole while maintaining safety standards.
- **Employ** an electrician to shut down the supply to the pole and possibly run a network wire up the pole, a process that might involve digging a trench to the nearest connection point.
- **Repeat** much of this labour-intensive process for repairs or upgrades.

To tackle this challenge, Sidewalk Labs has designed a standardized mount called “Koala” that would make it fast, inexpensive, and safe to install a device on a light pole or other street fixture by providing a sturdy physical mount, power, and network connectivity. Sidewalk Labs estimates its mounts would reduce the time of installation by roughly 92 percent — down from 30 hours today to two hours.¹⁰³

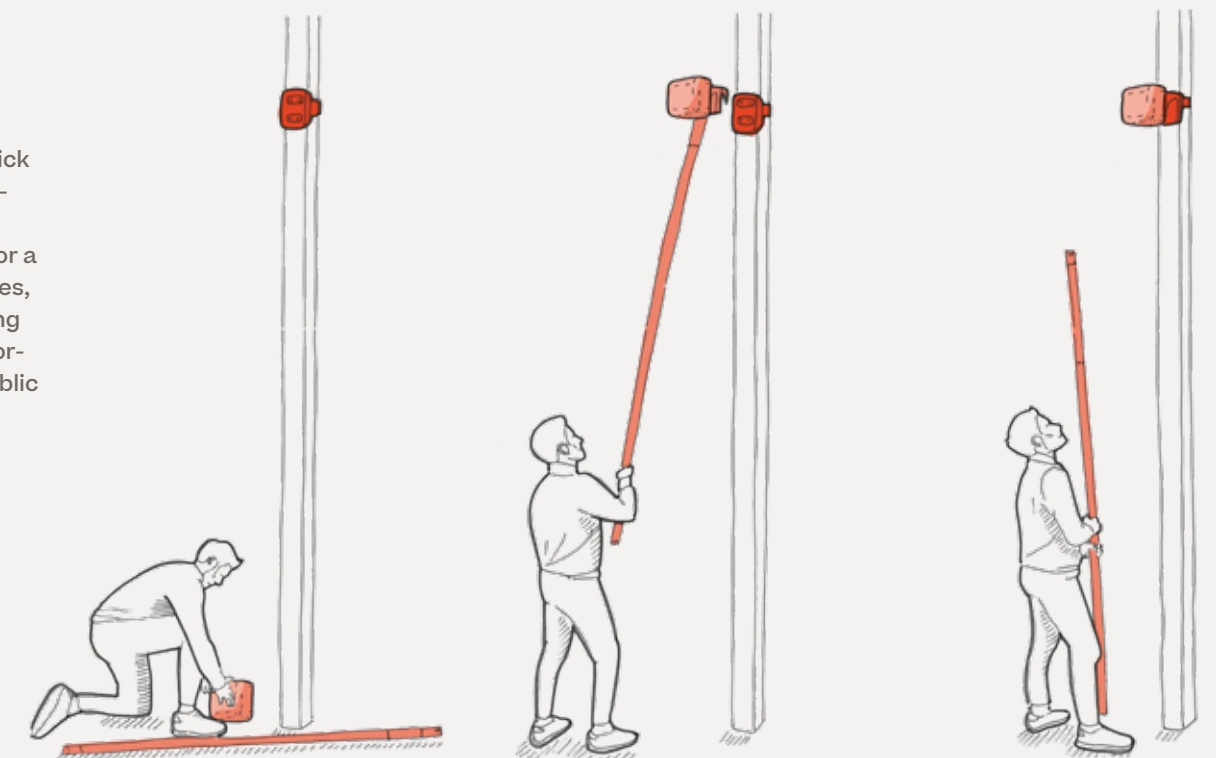
In addition to saving costs, Koala mounts would help cities avoid proprietary lock-in, as this open infrastructure would be capable of working with any device that meets its published standards — just like a USB port. Any proposal to collect or use urban data would be subject to the responsible data use process described on Page 240.

A standardized mount to reduce disruption

Today, without standardized digital infrastructure, even a basic traffic counter requires hours of work to mount, connect, and test.



Koala mounts would make it easy and quick to connect to a ubiquitous network and collect urban data for a multitude of purposes, from bicycle counting to air-quality monitoring to interactive public art installations.



Setting data standards that are open and secure

In Quayside, Sidewalk Labs plans to apply published standards and to use best-in-class security and resiliency techniques.

Key Term APIs

are standardized programming tools that enable computer systems to communicate. For example, when a Transit App shows bike-share availability at a nearby dock, it is using an API to connect with the bike-share system’s real-time database, process that data, and display it on a phone.

Enable third-party innovation with published standards

Openness is essential to provide new services that help improve quality of life and to inspire urban innovation by third parties. Just as no single company owns the web, no single company, organization, or agency should own the data or databases used by cities. They must be publicly accessible to improve upon, build on top of, or even replace.

Sidewalk Labs proposes a three-part plan to achieve its goal of a digitally open city:

Open architecture and APIs.

In Quayside, any digital hardware and software that Sidewalk Labs creates would use public standards that make it possible not just to access data easily but also to replace aspects of the hardware or software itself, avoiding lock-in from a single technology provider and encouraging innovation.

Sidewalk Labs commits to publishing an ongoing list of standards it uses. Where relevant standards do not exist, Sidewalk Labs would work with other companies, researchers, and standards bodies to create those standards.

To make that urban data available in ways that software developers can readily build, Sidewalk Labs proposes to provide data via well-defined, public application programming interfaces (APIs) — standardized programming tools that enable computer systems to communicate.

Open access.

In Quayside, Sidewalk Labs proposes to make properly protected urban data publicly accessible by default, enabling others to use it to create new services, tools, or products. As an extension of this policy, Sidewalk Labs proposes that this information be integrated into existing open-data portals containing relevant urban data — including the Toronto Open Data Portal and the Ontario Open Data Catalogue — expanding access even further.

Open source.

In Quayside, Sidewalk Labs proposes to make the software source code required for others to integrate with each of these systems publicly available under a free software licence. Sidewalk Labs has released several of its tools as open source, including the CommonSpace app for supporting public life studies. Sidewalk Labs plans to continue doing so in the future and to encourage others to do the same.

Use best-in-class resiliency and security

Sidewalk Labs plans to ensure that the digital technology used in Quayside is resilient as well as secure. Digital systems should not only be secure from hackers — they should also be reliable in the face of inadvertent actions or environmental effects and maintained in a way that keeps them functioning at a consistent level over time.

Sidewalk Labs’ approach to digital reliability emphasizes three design goals:

- First, as much as possible, prevent disruptions and the loss of functionality.
- Second, rapidly detect any loss in functionality or increased risk of loss of functionality through audits and other approaches.
- Third, prepare to rapidly restore functionality to any service that experiences a disruption.

These priorities are modelled after the standard approach taken by government and municipal services to ensure the resilience of critical systems, and are parallel to the software architecture concept “security by design.” Security by design refers to the principle that rather than being an afterthought, security should be considered at the beginning of the systems design process.

In Quayside, digital security and resiliency would be designed in from the start.

Technical spotlight

Current Sidewalk Labs cybersecurity practices

Though best practices in cybersecurity are always evolving, there are a number that Sidewalk Labs follows today and plans to follow in Quayside, including:

- **Encrypting** as much data as possible in storage and in transit using AES keys of 256 or 512 bits
- **Storing** keys in a key management system backed by FIPS 140-2 Level 3-certified hardware security modules
- **Enabling** client-managed encryption keys running on top of the same modules for any storage or computing resources to third parties
- **Using** HMAC to ensure message integrity with symmetric encryption
- **Preferring** elliptic-curve-based approaches over RSA for asymmetric encryption and digital signatures
- **Using** SHA-256 for general hashing and bcrypt for passwords
- **Preferring** multi-factor authentication methods over passwords alone
- **Routing** all traffic through TLS and, when that is not an option, physically partitioning devices from other networks

Creating a trusted process for responsible data use

Through the creation of an independent Urban Data Trust to oversee matters of digital governance, Quayside could establish a new standard for the responsible collection and use of data in cities.

Key proposed aspects of the Urban Data Trust:

- Independent entity (not controlled by either Sidewalk Labs or Waterfront Toronto)
- Five-person board with diverse representation
- Chief Data Officer to run daily operations
- Approve all collection or use of urban data in Quayside

A core condition for digital innovation is earning community trust that information collected in cities will preserve the privacy of individuals and be used for the greater good — all while supporting the growth of new businesses and the rise of new tools to improve urban life.

To help achieve this goal in Quayside, Sidewalk Labs proposes the establishment of an Urban Data Trust: an independent entity that would serve as the steward of urban data and the public interest.

Provincial and federal privacy commissioners would continue to oversee compliance with all privacy laws. Additionally, the Urban Data Trust would oversee matters of the digital governance of urban data for Quayside, including the approval and management of data collection devices placed in the public realm, as well as of any activities that involve the collection or use of urban data.

As described more in Volume 2, Sidewalk Labs believes the Urban Data Trust should be managed through a democratic process, and also supports the consideration of other recent proposals, including from MaRS and the Toronto Region Board of Trade, calling for independent entities whose mandate could be to govern data collection and use.

Beginning in Quayside, Sidewalk Labs proposes that the Urban Data Trust have two initial tasks.

First, it should establish a set of Responsible Data Use (RDU) Guidelines that would apply to all entities seeking to collect or use urban data in the IDEA District, incorporating globally recognized Privacy by Design principles. Second, it should implement and manage a process for approving the responsible collection and use of urban data anchored by a publicly auditable Responsible Data Use (RDU) Assessment — an in-depth review that is triggered by any proposal to collect or use urban data.

RDU Guidelines

Sidewalk Labs believes the Urban Data Trust would be in a position to determine the most appropriate RDU Guidelines. For consideration as an initial set, however, Sidewalk Labs submits the following guidelines, which it has implemented internally for pilots that undergo privacy assessments:

Beneficial purpose. There must be a clear purpose and value to any proposed use of urban data.

Transparency and clarity. Organizations should inform individuals of how and why data would be collected and used in a way that is proactive, clear, and easy to understand.

Data minimization, security, and de-identification by default. Organizations should collect the minimum amount of data needed to achieve the beneficial purpose and use the least invasive technology available to achieve the beneficial purpose.

Publicly accessible by default. Organizations should make properly de-identified or non-personal data that they have collected publicly accessible to third parties by default, formatted according to open standards.

No selling or advertising without explicit consent. Such precautions are necessary because individuals often do not know when their personal information is being sold or used for such purposes.

Responsible AI principles required. Organizations should be required to show how they have incorporated Responsible AI principles to reduce the likelihood of biased and unethical outcomes.

A clear process for approval

Sidewalk Labs proposes that once the Urban Data Trust and RDU Guidelines have been established, a transparent process should be created for any proposals seeking to collect or use urban data.

Step 1: Classify the data. If urban data is involved, then the proposal would fall under the jurisdiction of the Urban Data Trust and the data collector should move on to Step 2 of the process.

Step 2: Submit an RDU Assessment. Entities seeking to collect or use urban data complete an RDU Assessment: an in-depth review outlining the purpose of the digital proposal, the type of urban data it aims to collect, its potential impact on the community, and its risks and benefits.

Step 3: Receive a decision. Sidewalk Labs proposes that the Urban Data Trust determine whether the data activity should proceed based on the organization’s attestation to applicable laws, as well as a subjective and objective evaluation of the RDU Assessment.

Step 4: Meet post-approval conditions. A set of post-approval conditions include transparency (making RDU Assessment summaries available), device registration (including a real-time public map of digital devices), data access, data sharing and licencing agreements, and auditing.

Sidewalk Labs has already committed publicly that it would not sell personal information to third parties or use it for advertising purposes. It also commits to not share personal information with third parties, including other Alphabet companies, without explicit consent.

Catalyzing innovation by launching core digital services that others can build on

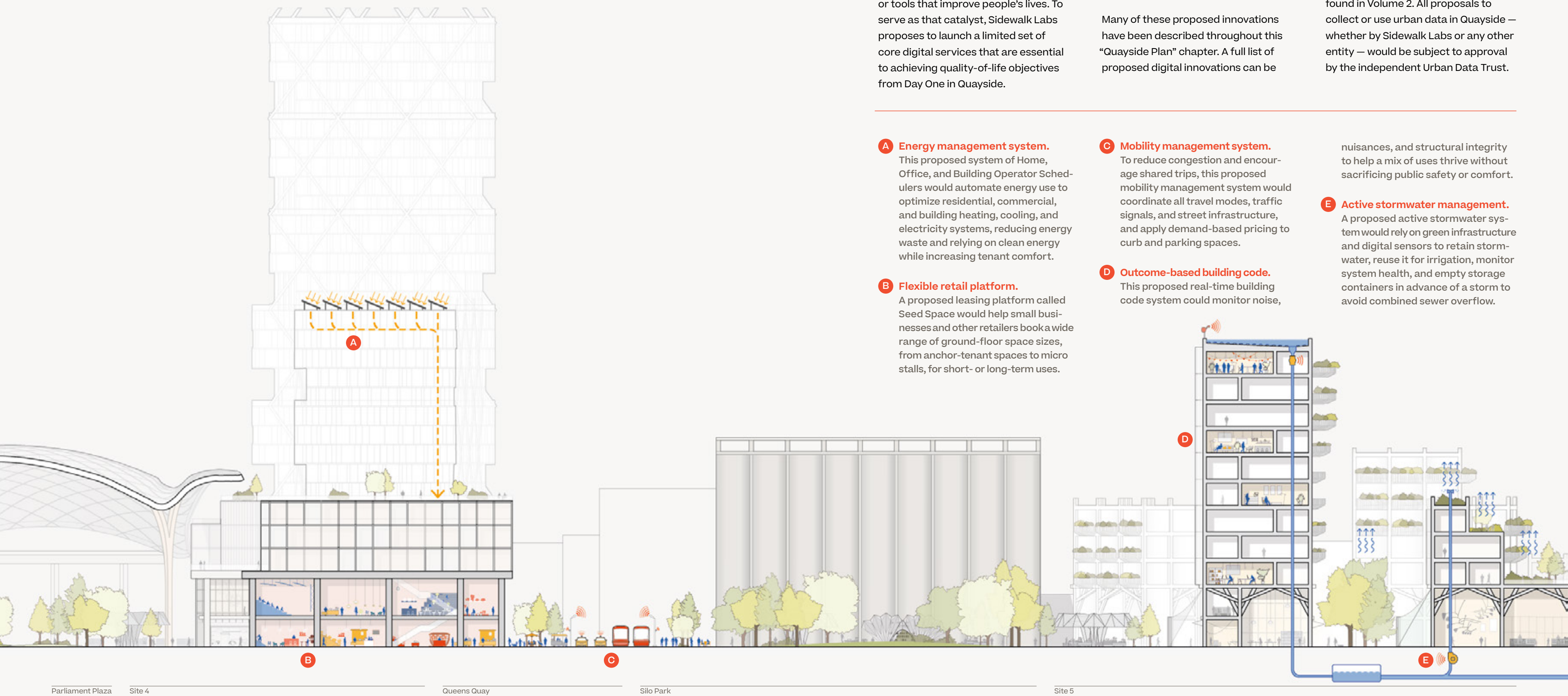
Sidewalk Labs proposes to launch a limited set of digital services in Quayside designed to tackle tough urban challenges and inspire countless subsequent innovations by third parties.

A true ecosystem of urban innovation requires a catalyst that makes it possible for third parties to build new digital applications, services, products, or tools that improve people's lives. To serve as that catalyst, Sidewalk Labs proposes to launch a limited set of core digital services that are essential to achieving quality-of-life objectives from Day One in Quayside.

These core services would not only deliver improvements in affordability, mobility, sustainability, and economic opportunity, but also would make the urban data they generate publicly accessible to others (with proper protections), enabling countless subsequent innovations to emerge from local companies, entrepreneurs, startups, researchers, agencies, civic groups, and others.

Many of these proposed innovations have been described throughout this "Quayside Plan" chapter. A full list of proposed digital innovations can be

found in Volume 2. All proposals to collect or use urban data in Quayside — whether by Sidewalk Labs or any other entity — would be subject to approval by the independent Urban Data Trust.



- A Energy management system.** This proposed system of Home, Office, and Building Operator Schedulers would automate energy use to optimize residential, commercial, and building heating, cooling, and electricity systems, reducing energy waste and relying on clean energy while increasing tenant comfort.
- B Flexible retail platform.** A proposed leasing platform called Seed Space would help small businesses and other retailers book a wide range of ground-floor space sizes, from anchor-tenant spaces to micro stalls, for short- or long-term uses.

- C Mobility management system.** To reduce congestion and encourage shared trips, this proposed mobility management system would coordinate all travel modes, traffic signals, and street infrastructure, and apply demand-based pricing to curb and parking spaces.
- D Outcome-based building code.** This proposed real-time building code system could monitor noise,

- nuisances, and structural integrity to help a mix of uses thrive without sacrificing public safety or comfort.
- E Active stormwater management.** A proposed active stormwater system would rely on green infrastructure and digital sensors to retain stormwater, reuse it for irrigation, monitor system health, and empty storage containers in advance of a storm to avoid combined sewer overflow.

A Robust Public Engagement Process, Reaching Thousands of People

The Sidewalk Toronto project teams solicited a wide range of feedback and inputs from thousands of people across the city, including residents, researchers, community leaders, and government agencies. This unprecedented level of preliminary public input helped shape the Quayside development plan.

Consultation by the numbers

- ~21,000 people engaged in person during Sidewalk Toronto and 307 events
- ~280,000 online views of live-streamed events or videos
- More than 11,000 visitors to 307 since June 16, 2018

To date, the Sidewalk Toronto public engagement program has reached more than 21,000 Torontonians of all ages. Credit: Jenna Wakani

After Sidewalk Labs was selected by Waterfront Toronto as Innovation and Funding Partner, the Sidewalk Toronto project launched in October 2017. Public engagement began shortly after the project launch and occurred alongside this period of intensive planning work. This type of extensive engagement from the outset is critical to designing a plan that truly reflects the aspirations and ideas of Torontonians.

In November 2017, some 530 Torontonians showed up on a chilly evening, packing the St. Lawrence Centre for the Arts to hear about the Sidewalk Toronto project. The live-streamed discussion from this initial Town Hall has since been viewed by over 5,000 people online. It was the start of a sprawling conversation that, over the course of the next 18 months, would become one of the city’s largest-ever public discussions on an urban development — and is still ongoing.

At that first Town Hall, Torontonians said they wanted a community engagement process that would be inclusive, transparent, frequent, wide-reaching, and meaningful. Soon after, Sidewalk Labs released its participation plan:

13 different programs that would ultimately connect the project with tens of thousands of Torontonians.

Sidewalk Labs’ subsequent outreach has included dozens of community meetings and programs. A series of large-scale roundtable meetings helped to keep people informed of the latest project updates and asked them to weigh in on key topics, from the principles guiding the planning process to the initial drafts of the plan for Quayside. A series of public talks brought local and global experts to broaden the conversation on safe street design, housing affordability, accessibility, and sustainable buildings.

The engagement plan included two intensive programs for representative groups of Torontonians. One was the Sidewalk Toronto Residents Reference Panel: a group of 36 residents from every corner of the city and diverse backgrounds. Across six Saturday sessions, spread over nine months and dozens of hours, the panelists received an in-depth look at many aspects of the Sidewalk Toronto project and provided a detailed set of recommendations, helping to shape the plan in the best interests of all Torontonians.

The other intensive program was the Sidewalk Toronto Fellows program, designed as an opportunity for 12 early-career Torontonians aged 19-24 to travel to cities across North America and Europe and learn about waterfront revitalization and the use of technology. The fellows represented a range of perspectives, skills, and educational backgrounds from all over Toronto. They synthesized their learnings and published a report of recommendations that has directly influenced Sidewalk Labs’ planning teams.





Consultation by the numbers
→ 100+ hours spent co-designing with communities
→ ~1,700 total hours volunteered by Resident Reference Panel members
→ ~2,300 total hours committed by Sidewalk Toronto fellows
→ Worked with 75 experts, across six expert advisory groups

The outreach effort stretched across all ages, including a partnership with the YMCA that led to a kids camp.

Bringing informed scrutiny into the heart of the project was essential. Sidewalk Labs convened six topic-specific advisory boards filled with local experts to challenge and improve the project’s assumptions. Project members also held hundreds of one-on-one or small group meetings — including concerted outreach to the business, academic, non-profit, and institutional sectors — and engaged extensively with Waterfront Toronto and public officials at all three levels of government.

This programming was complemented by consultations held by Waterfront Toronto, including Civic Labs focused on digital elements of the project and “design jams” that provided stakeholders and residents with an opportunity to engage deeply with aspects of the project focused on vertical living, cycling, and the water.



Sidewalk Labs’ Amina Mohamed discusses a student-created model imagining the future of Quayside with visitors to 307. More than 11,000 Torontonians have visited 307 since it opened in June 2018. Credit: Jenna Wakani

Learning from many voices

In June 2018, Sidewalk Labs opened a Toronto office and innovation workspace in Quayside called 307, housed in a former fish-processing plant in Quayside. All summer long, 307 hosted special events

that attracted residents, artists, and innovators to learn more about the Sidewalk Toronto project, engage with early explorations into a variety of urban innovations, and provide valuable feedback.

Since its opening, 307 has welcomed more than 11,000 people, creating a dynamic and original venue for consultation and exploration.

In the latter half of 2018, Sidewalk Labs reached out to groups whose voices had been missing and brought them to the design and planning table, and also strived to meet people in their own communities.

Teams worked with members of the Indigenous community for a design workshop; engaged seniors in a charrette around housing; travelled to middle schools to ask children and youth for their ideas; and held a series of co-design sessions with members of the accessibility community and with people with lived experience of addiction and mental health challenges, in collaboration with the Inclusive Design Research Centre at the Ontario College of Art and Design University.

Consultations were also held with residents and students from the inner suburbs of Rexdale and Scarborough, with the Lived Experience Advisory Group to the City of Toronto’s Poverty Reduction Strategy, and with the Toronto Community Benefits Network to explore ways in which the project could drive equity, opportunity, and social inclusion.

Planning teams also commissioned ethnographic research that emphasized the inclusion of diverse voices or voices often missed in the traditional public engagement process for reasons such as geography, awareness, or access.

These studies focused on public space, family housing, and community care.

“North of the Water”: Generating open space principles

Sidewalk Labs collaborated with Doblin, Deloitte’s consulting practice on human-centred design, and Park People, Canada’s leading charity devoted to improving public space, to understand which factors contribute to a sense of belonging in public space. The “North of the Water” research involved 40 Torontonians who had previously not participated in a formal public engagement process, representing 23 different neighbourhoods and a mix of ages and backgrounds. The work drew from in-depth interviews, “research walks” through public space, and daily diaries. A final report — available on the Sidewalk Toronto website — resulted in six design principles for great, inclusive public space.

“Living Well on the Waterfront”: Understanding health needs

Sidewalk Labs commissioned the design firm Idea Couture to provide an understanding of the health needs of Torontonians. Twenty residents and service providers — from a mix of age groups and cultural, professional, and political backgrounds — were interviewed in their homes and communities. Idea Couture and Sidewalk Labs then hosted a co-design charrette at the Centre for Social Innovation in Toronto, with participants from both the public and private sectors, to co-create more than 90 ideas on the future of community care. The resulting report sketched out a concept for a new type of community-based care hub in Quayside.



“Family Lifestyles”: Informing a new housing toolkit

With SHS Consulting, a Toronto-based housing research firm, Sidewalk Labs conducted research with 25 low- or middle-income couples and families to uncover the housing needs of Torontonians — beyond the typical downtown resident. This work interviewed couples and families from the Toronto core, Etobicoke, and Scarborough in their homes and conducted a three-hour co-design workshop at 307, where families responded to a unit mock-up, tried out digital prototypes, and filled out workbooks. This direct feedback helped the Sidewalk Labs planning teams develop and validate certain concepts in a new housing toolkit.

To date, Sidewalk Labs has heard first hand from more than 21,000 Torontonians.

But the listening does not stop here. Sidewalk Labs will continue learning from Torontonians and incorporating their feedback as the plans for Quayside and the eastern waterfront come to life.

Accessibility has been a core focus of the Sidewalk Toronto public engagement program, with Sidewalk Labs’ planning teams holding more than 14 co-design events and 70 hours of workshops with the accessibility community. Credit: Jenna Wakani



See the “Public Realm” chapter of Volume 2 for more details on this research.



Consultation milestones



Endnotes

General note: Unless otherwise noted, all currency figures are in Canadian dollars.

Charts note: Sources for the charts and figures in this chapter can be found in the accompanying copy for a given section; otherwise, the numbers reflect a Sidewalk Labs internal analysis. Additional information can be found in the MIDP Technical Appendix documents, available at www.sidewalk-toronto.ca/midp-appendix.

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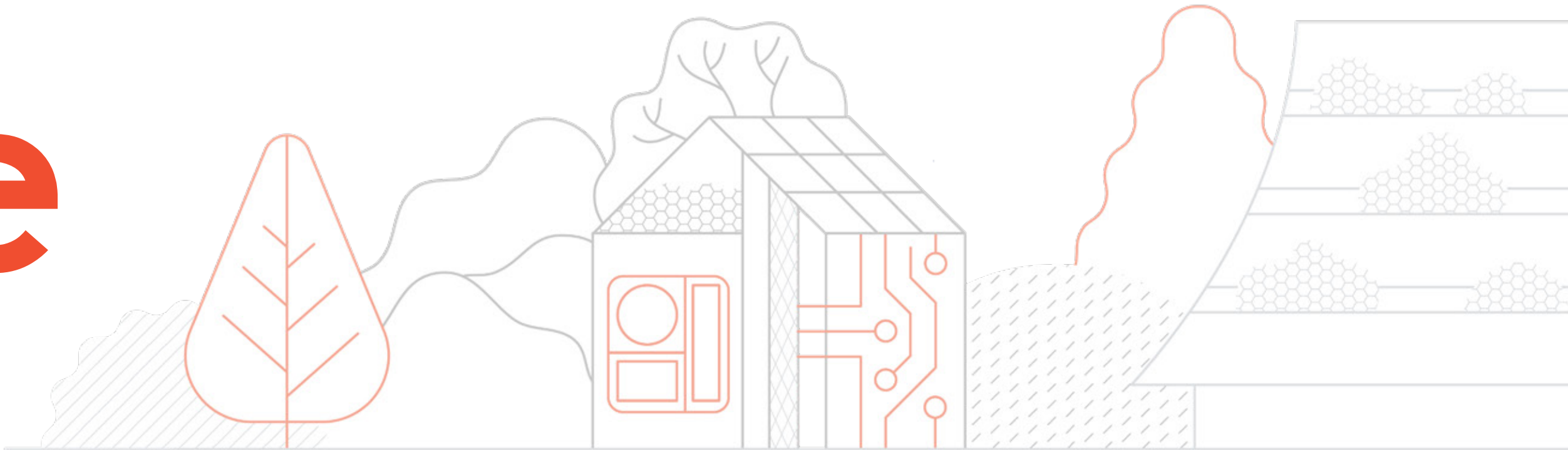
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Quayside can emerge as a starting point to address the broader challenges of city life and become a model for how urban communities can meet the needs of new generations.

The River District



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Planning Holistically to Achieve Toronto’s Goals

Extending Quayside’s innovations into the River District would enable Toronto to capitalize on existing public investments and leverage the significant proposed investments by Sidewalk Labs to fulfill the waterfront’s extraordinary potential.

For decades, Toronto’s planners have recognized the opportunity for the eastern waterfront to play a critical role in addressing Toronto’s challenges.¹

Yet despite the success of the Film District studios and the improvements to Cherry Beach, the area continues to have much greater potential to contribute to the fabric of the city than is currently being realized. While there has always been a general agreement that the eastern waterfront should have a strong focus on employment and jobs, unlocking that potential has been an ongoing challenge for decades.

An important step was taken when Waterfront Toronto and its government partners initiated the Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment, which considered how to eliminate a first barrier to development: flooding. The result was the \$1.25 billion Don Mouth Naturalization plan currently underway.²

As another important step, the Port Lands Planning Framework and Villiers Island Precinct Plan have established a vision to guide the transformation of the area over the next half century.³ The framework emphasizes the development of mixed-use neighbourhoods surrounding the renaturalized Don River and on the newly created Villiers Island to provide much-needed spaces for production, interactive, and creative jobs and for affordable housing, anchored by an expanded transit network and vibrant public spaces.

But even with the significant recent public investment, the area still lacks even basic infrastructure and remains separated from the great neighbourhoods that surround it to the north. Despite a shared recognition of the systems required to achieve

the eastern waterfront’s potential, such as new public transit lines, there is currently no clear path to funding and building them.

Drawing on its unique mission to integrate new technology and urban design to improve urban life, Sidewalk Labs proposes to work with Waterfront Toronto and the City of Toronto to develop innovative approaches, tools, and resources to deliver the necessary infrastructure to build on Toronto’s planning foundation and accelerate the realization of major policy objectives.

This partnership could fulfill the revitalization vision for the eastern waterfront with a focus on urban innovation, economic development, environmental sustainability, improved mobility and affordability, and social inclusion.

As described in the previous chapter of Volume 1, the opportunity begins in Quayside, which can become a globally significant demonstration project that advances a new model for sustainable and innovative urban development. Its relatively intimate scale presents a perfect environment to prove the viability of the proposed innovations.

But many of the innovations initiated in Quayside can only achieve their full potential and become financially feasible when applied at a larger scale. That is why Sidewalk Labs is proposing a second phase for the project across a larger geography it is calling the River District.

Together, Quayside and the River District form the basis of the Sidewalk Toronto project proposal to transform a small portion of the eastern waterfront — less than one third to be developed over 20 years — into an Innovative Design and Economic Acceleration (IDEA) District that can catalyze tens of thousands of jobs and help tackle the major challenges facing Toronto today.



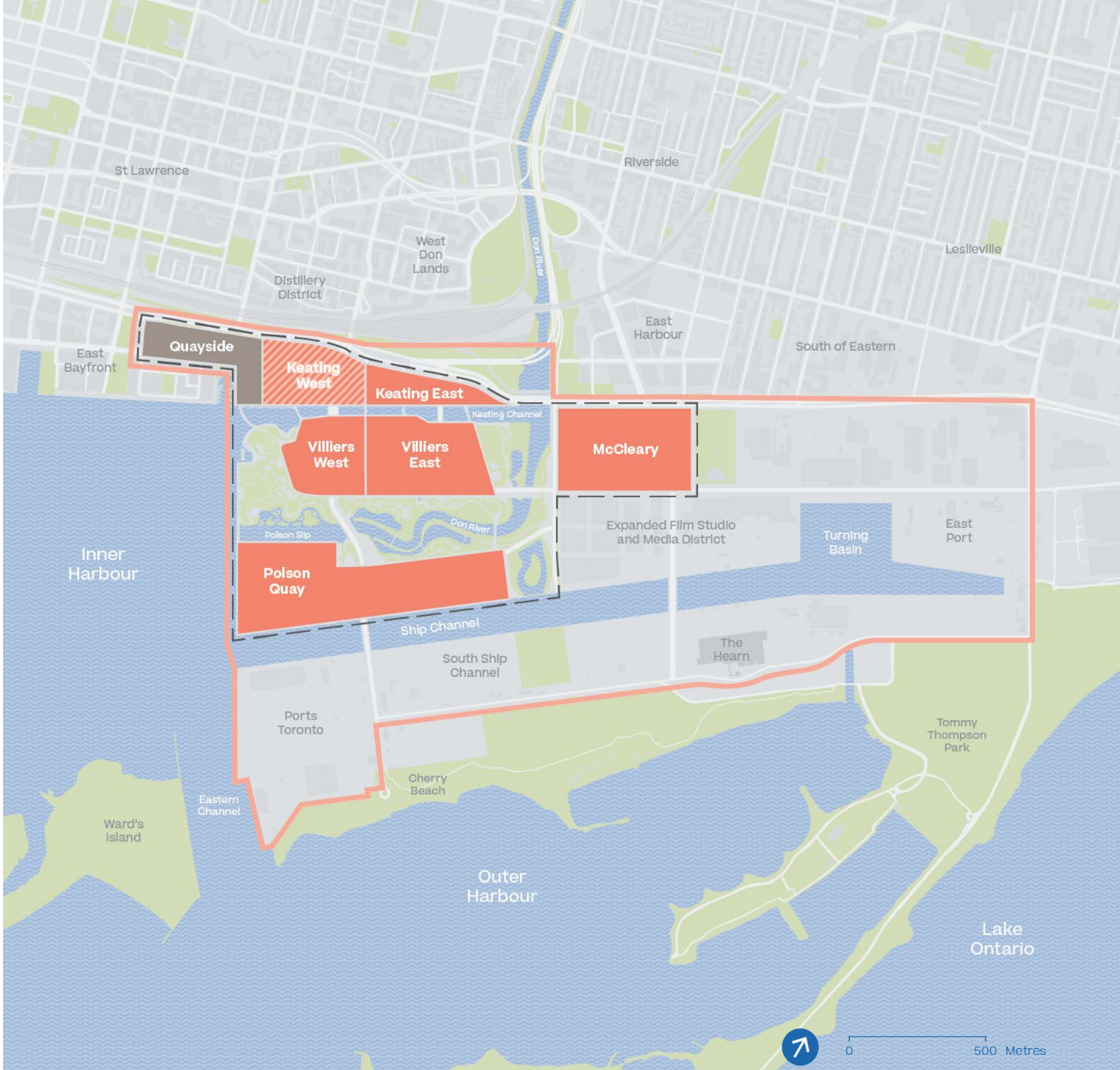
Unlocking the full potential of the underutilized eastern waterfront for inclusive urban growth has been a challenge for decades.
Credit: Mark Wickens

This limited geography recognizes that there are successful industries already in place that require their own spaces to expand. That is why the growing Film District is not included as part of the proposal. Neither is East Port, which is an important location for the consolidation and ongoing operation of larger industrial uses.

While the Film District and East Port are not part of this proposal, the River District development would seek to partner with them and support them where appropriate. Such efforts might include incorporating technology into the streetscape to facilitate film shoots or fostering research into green industrial practices that could benefit companies in the East Port.

The River District also does not include Keating West, which consists of two privately owned parcels that have already undergone precinct planning and had zoning bylaws adopted by council. These sites would, at their discretion, have the option to participate in the advanced sustainable infrastructure program proposed by Sidewalk Labs.

Sidewalk Labs' proposed role in development would also shift as the project expands into the River District; this role is described more in the following section, beginning on Page 260.



Map

The IDEA District and eastern waterfront geography

- Eastern waterfront
- - - IDEA District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2

The River District: Proposed geography and roles

The River District, a 62-hectare area just beyond Quayside that surrounds the naturalized Don River and ends at the Ship Channel, would consist of five neighbourhoods: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay.

Collectively, these areas contain sufficient scale, density, and diversity to unlock opportunities for Waterfront Toronto and the city to fully realize shared objectives. While the specific plans developed by the responsible government agencies would respond to the unique potential of each neighbourhood site, collectively these communities can become a global showcase for a new kind of live-work-make model for urban life, driven by adaptable designs that can respond to the changing needs of future generations.

It is Waterfront Toronto's mandate to lead the urban planning, design, infrastructure delivery, and real estate development associated with broader geographies along the eastern waterfront. Sidewalk Labs proposes that government designate a public entity to serve — or in the case of Waterfront Toronto, continue to serve — as revitalization lead for the IDEA District.

Waterfront Toronto selected Sidewalk Labs as the partner best suited to achieve its objectives around economic opportunity, sustainability, mobility, and affordability. As a company founded to leverage the latest innovations to improve the quality of life in cities, Sidewalk Labs can bring together the expertise and tools required to devise, finance, and implement creative solutions to large-scale problems.

Sidewalk Labs believes that the best way to achieve Toronto's goal of creating an innovation showcase along the waterfront is by demonstrating leadership and empowering others to do the same. That is why a fundamental part of its plan is to create conditions that allow third parties to easily access, explore, adapt, and build on its ideas and technologies.

In one area of the River District, Villiers West, Sidewalk Labs proposes to be the lead real estate developer in concert with local development partners, with Google's relocated Canadian headquarters as the centrepiece, to create a major economic hub focused on urban innovation. In total, Sidewalk Labs proposes leading development (with local partners) only on Quayside and Villiers West — less than 7 percent of the eastern waterfront.



Map
**River District
geography
and roles**

- IDEA District
- River District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2
- Sidewalk Labs develops real estate and advanced systems



For more information on proposed roles, see the “Innovation and Funding Partnership Proposal” chapter of Volume 3.

The proposed River District would create the conditions that enable third parties to develop urban innovations, unlocking improvements and solutions that are as yet unimagined.

In the rest of the River District, an array of third parties would take over the development, and Sidewalk Labs’ roles would include supporting Waterfront Toronto as the planning, design, and implementation partner (including the creation of innovation design standards and guidelines); deploying a core set of technology solutions required to achieve key project objectives; and financing infrastructure (an optional role). A mixture of public, private, and non-profit entities would develop buildings, create jobs, provide housing opportunities, and deliver social and community infrastructure.

Reflecting these roles, the River District chapter includes considerable planning details for Villiers West but only includes concepts for the other proposed River District neighbourhoods. This chapter also describes how each core innovation pillar initiated in Quayside generates greater quality-of-life benefits — and in some cases only becomes financially viable — at scale.

Sidewalk Labs believes that its unique approach to planning, supported by a new partnership model that harnesses the private sector’s ability to help realize public policy goals, would create the conditions that enable third parties to develop urban innovations, unlocking improvements and solutions that are as yet unimagined.

The River District’s Scale Is Necessary to Realize Priority Outcomes

Quayside’s five hectares make it a perfect place to explore new innovations to improve quality of life, but many can only become effective or financially feasible at the scale of the 62-hectare River District.

Waterfront Toronto has established five priority outcomes to guide the MDP: job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).⁴ Achieving these goals will require establishing strong economic anchors; building new public transit connections; designing, financing, and operating advanced infrastructure systems; and developing financial tools that can generate significant new value to help fund affordable housing.

These systems and approaches become feasible only when they are applied to an area large enough to support the substantial resources required to develop, implement, and run them. For that reason, several of the foundational innovations proposed in Quayside are possible only when they are designed and implemented in the context of the broader geographic area that includes the River District.



Proposed innovations that can only exist at scale

Many urban systems benefit from scale; more space can mean more amenities and more potential experiences. Some require scale to exist at all. They simply cannot be financed or successfully operated without a certain amount of density to support them. Here is a list of the innovations proposed in the MIDP that would only be possible at the scale of the River District, either for technical, financial, or operational reasons.

This list is introduced briefly here and described in greater depth in the sections that follow.

1 Attracting new economic anchors is only possible at scale.

→ **Urban innovation cluster.** A mixed-use development area with sufficient space and amenities is needed to attract an economic anchor that can generate significant jobs and establish an ecosystem of ongoing urban innovation.

→ **Factory-based construction.** A critical mass of construction is needed to catalyze a Canadian tall timber industry and justify investment in a modular production factory in southern Ontario.

2 Supporting advanced infrastructure to achieve climate positivity is only possible at scale.

→ **Climate positivity.** A sufficient development area and density are needed to finance and operate the advanced infrastructure systems core to creating a climate-positive community.

3 Unlocking significant progress towards affordability is only possible at scale.

→ **Affordable housing.** Sufficient development areas and densities are needed for new financial tools to ensure that developers can help support public goals around below-market housing, managed by a new housing trust.

4 Creating a 21st-century mobility network is only possible at scale.

→ **Public transit expansion.** A sufficient development area and density are needed to self-finance the construction of the planned public transit extensions — without competing with other city funding priorities.

→ **New mobility options.** Providing an area large enough to establish a full network of new mobility options is necessary to integrate new technologies and to improve and expand multiple modes, including public transit, walking, cycling, ride-hailing, and micro-mobility options.

1

Attracting new economic anchors

Sparkling an urban innovation cluster.

Quayside can establish the foundation of a district that actively supports innovation, creativity, and exploration, but it does not have the space to accommodate an economic cluster's potential expansion or a sufficient density of housing, retail, and amenities to support tens of thousands of new workers and residents.

The River District presents this opportunity. Alphabet commits to establishing a new Canadian headquarters for Google on the western edge of Villiers Island, as part of an agreed-upon transaction within the IDEA District. **Alphabet would target up to 500,000 square feet, which would be sufficient to accommodate as many as 2,500 jobs, the majority of which would be for Google employees (though actual hiring would depend on market conditions and business requirements).**

This new headquarters would be the centre and catalyst for a new innovation campus, amplifying the area's economic potential. Based on experience in a variety of other cities, it is expected that the Google tenancy would attract an array of other companies in the Toronto tech ecosystem to locate at the innovation campus.

This campus would also include the Urban Innovation Institute, a new non-profit applied research institute designed to bring together academia, industry, entrepreneurs, advocates, and public agencies to collaborate on tackling urban challenges. The proposed institute would be developed with local universities and

government partners, with the idea of helping innovators access, contribute to, and export the learning made possible throughout Quayside and the River District.⁵

The innovation campus would be a major employment anchor for the revitalized eastern waterfront, complementing the Film District expansion and the East Harbour development. **In total, Sidewalk Labs estimates that 10,500 of the 93,000 IDEA District jobs would be focused on urban innovation, creating a new economic engine around this emerging area.**

Catalyzing a mass timber industry.

As the world's first entirely mass-timber neighbourhood, Quayside can help demonstrate the feasibility and benefits of this new sustainable building material. But Sidewalk Labs estimates that a larger development area — roughly 6 million square feet — is needed to justify an investment in the factory-based production of mass timber, as well as for such a factory to hit peak efficiency in producing sustainable building components on a predictable timeline that developers can trust.

Extending this approach across the River District could catalyze the creation of a new Canadian industry that capitalizes on the country's abundant green-certified forests, and could support a new modular factory that accelerates construction timelines by up to 35 percent.⁶

2

Supporting advanced infrastructure to achieve climate positivity

Waterfront Toronto sought a unique funding and innovation partner because it recognized that its ambitious goal of creating a climate-positive community — which requires exporting clean energy outside of a project area or actively reducing Toronto’s current greenhouse gas emissions through carbon offsets — cannot be achieved by simply extending existing infrastructure into new neighbourhoods. But designing, implementing, and operating the new, advanced infrastructure systems necessary to achieve climate positivity requires a large enough customer base to be effective and financially feasible.

Specifically, to keep Quayside resident energy bills in line with Toronto averages, the advanced power and thermal grids would require a \$19 million supplemental

innovation investment based on the current plan, due to factors including the high cost of geothermal exchange and initial electric grid connections, in addition to the poor economies of scale for operating costs. While this is not financially sustainable at the scale of each neighbourhood, no additional supplemental innovation investment would be required to extend operations into the River District beyond Villiers West, because the systems scale in a financially sustainable way.

The River District would provide a large enough area to support these investments, including new infrastructure to eliminate the use of natural gas and implement an advanced electric power grid, a new thermal energy grid for heating and cooling buildings, a new anaerobic digestion facility to process organic waste, and new digital technologies that can optimize energy use within buildings.⁷ This holistic plan could also encourage local companies and innovators to invest in new technologies (such as advances in battery storage capacity) to support the emerging cleantech industry.

With public-sector support, the Sidewalk Toronto project could become the largest, densest climate-positive district in North America and the third largest in the world — establishing a credible path forward for cities to follow.

The Sidewalk Toronto project could become the largest climate-positive district in North America.

3

Unlocking significant progress towards housing affordability

Waterfront Toronto has recognized that the eastern waterfront can become an essential piece of the city’s strategy to address increasingly urgent affordable housing needs — and that doing so creates an opportunity to honour the city’s commitment to inclusive, diverse neighbourhoods.

Sidewalk Labs has embraced this mission, with an ambitious commitment to make 40 percent of units in Quayside available at below-market rates.⁸ But with 2,600 total housing units, and roughly 1,000 below-market units, the neighbourhood has a limited ability to make a substantial dent in the city’s housing market.

To make a significant dent, Sidewalk Labs plans to explore a series of private funding sources that can help support an ambitious vision for housing affordability. These sources include affordability by design (using efficient unit design to create more total units, and thus additional value); the increased value of public land due to factory-built timber construction; and a condo resale fee.

At the Quayside scale, however, only affordability by design would create value (roughly \$37 million) that could be directed towards a below-market housing program. Generating land value from factory-based construction requires 6 million square feet of delivery output — far more than available in Quayside — to refine the factory process and reliably accelerate project timelines and reduce project risks for developers. And generating funds from the resale fee require ongoing condo turnover, and thus additional phases of development.

Applying these strategies at the scale of the River District has the potential to generate more than \$1.4 billion for below-market housing and support the creation of a housing trust fund that can assemble and distribute these funds.⁹ With this approach, the district would include an estimated 13,600 below-market units. (See Page 384 for more details.)

It also would offer a new range of housing types, ownership and rental models, and flexible units, creating inclusive communities that welcome Torontonians across all lifestyles, life stages, and income levels.

Housing affordability by the numbers:

- 40% below-market vision
- More than \$1.4 billion in private funding
- Up to 13,600 below-market units (with additional government support)

Creating a 21st-century mobility network

Extending the LRT into the Port Lands.

Toronto has planned an extension of its public transit network across the eastern waterfront since 2006, recognizing light rail's role in supporting the development of sustainable neighbourhoods. But the plans, which could cost as much as \$1.2 billion, remain unfunded.¹⁰ Sidewalk Labs is proposing, if public funding is not available, that this critical project can be built now and financed through future revenue streams generated by the development made possible by the transit extension.

This self-financing approach is a proven strategy for accelerating transit construction in a way that does not compete with other public spending priorities.¹¹ Sidewalk Labs is prepared to provide financial support to this approach, but it only becomes viable if the new transit lines would serve a sufficient amount of development.

Quayside's proposed development of 10 buildings (roughly 2.65 million square feet) is not large enough to sustainably support the financing of the waterfront light rail. An area the size of the proposed River District (nearly 27 million square feet) could provide enough density to pursue promising self-financing methods for the light rail, such as tax increment financing.

Once built, the new light rail lines would become a fundamental driver of the eastern waterfront's economic development strategy, accelerating the creation of thriving new transit-first neighbourhoods.

Designing a network of new mobility options.

The limited street network of Quayside can be used to develop new ways to design streets that prioritize people and cyclists, improve the efficiency of how space is allocated as travel patterns shift across a day, and incorporate adaptable features that can respond to new mobility options as they emerge. But while the neighbourhood's four blocks can be an effective demonstration project, streets only have transformative impact when they form a network.

If Quayside's mobility innovations are applied across the River District, there would be opportunities to give residents, workers, and visitors a full set of transportation options designed to meet all of their needs without owning a car, helping to reshape mobility patterns across the city. Within the IDEA District, 77 percent of trips could be made through transit or active modes.

Toronto could also take a leadership role on how to thoughtfully integrate emerging mobility options like self-driving vehicles. The River District could showcase the world's first street network designed to integrate self-driving vehicles in a way that supports public transit use, shared rides, and enhanced pedestrian and cycling experiences.

Creating the conditions for urban innovation

The true impact of the proposed innovations would come not as individual components but as a comprehensive set of initiatives that together can create the conditions to improve how cities function and enhance quality of life.

By establishing the physical, digital, and policy conditions for urban innovation, the River District can become a beacon for researchers, entrepreneurs, civic organizations, government agencies, and innovators from around the globe to create countless new services and products designed to improve urban life.

At the heart of this vision is the ability to create the digital conditions for others to build on. These include:

- Providing more affordable and flexible digital infrastructure, such as ubiquitous connectivity and standardized mounts
- Setting data standards that are open and secure
- Creating a trusted process for responsible data use, with a proposed independent Urban Data Trust to oversee and approve the use or collection of urban data
- Launching core digital services that others can build on through open access to properly protected urban data.

Together, these conditions would help the IDEA District become an economic engine — with a focus on urban innovation — that generates up to 93,000 total jobs, \$14.2 billion in annual economic output (GDP), and \$4.3 billion in annual tax revenue by 2040.

But while Quayside is the perfect demonstration site to begin developing these digital conditions, many require the scale of the River District to realize their full potential.

For example, new advances in fibre-optic technology and network security can build on Waterfront Toronto's progress bridging the digital divide by offering residents and businesses access to secure, super-fast internet connections at an affordable cost. These advances can also enable countless new solutions to be developed by a wide array of third parties, supporting the development of an economic cluster in urban innovation. But such an advanced network only becomes financially sustainable at the scale of the River District, given the number of residents or businesses needed to recoup the initial investment in core enabling infrastructure.

By planning holistically, and over a large enough area, the integration of these systems and innovations can unlock transformative change. This is the opportunity before Toronto.



See the “Digital Innovation” chapter of Volume 2 for more details on these proposed initiatives.

Key Term Urban data

Information gathered in the city's physical environment, including the public realm, publicly accessible spaces, and even some private buildings.

River District impact: The new bottom line

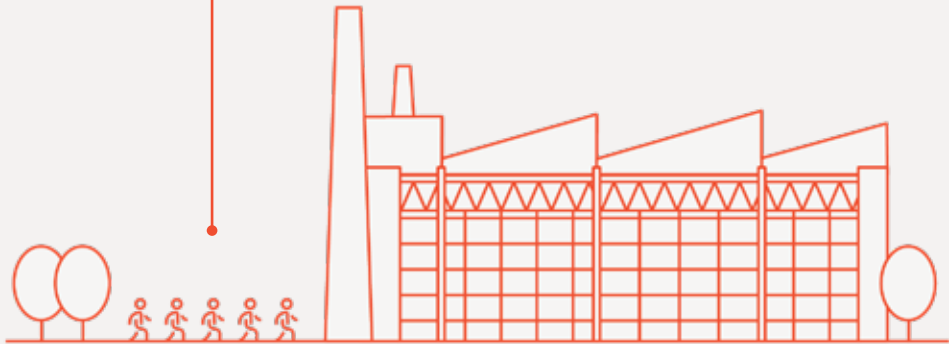
The combined impact of Sidewalk Labs’ proposal for Quayside and the River District could achieve Waterfront Toronto’s priority outcomes around job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance) — establishing the waterfront as a global demonstration project.¹²



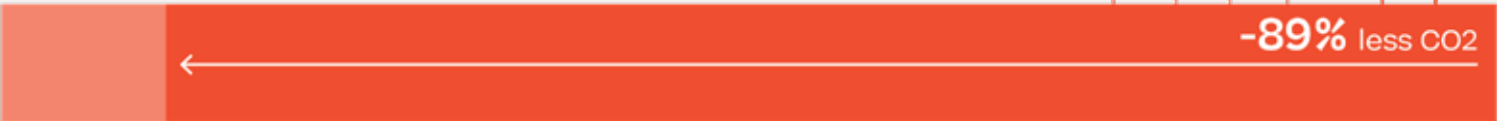
Economic impact

An economic engine that creates 93,000 total jobs (including 44,000 direct jobs) and generates \$14.2 billion in annual economic impact by 2040

A new Ontario-based factory that catalyzes a Canadian mass timber industry

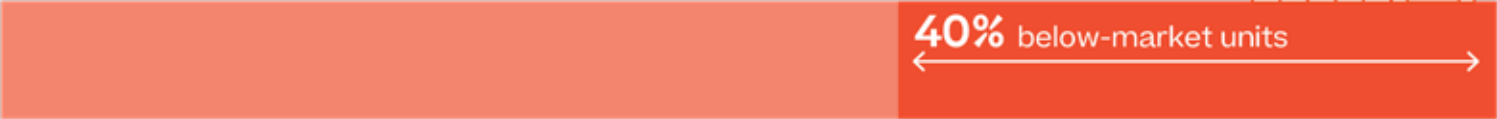
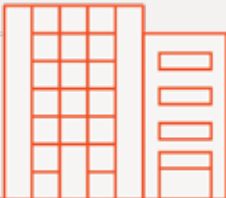


Climate impact



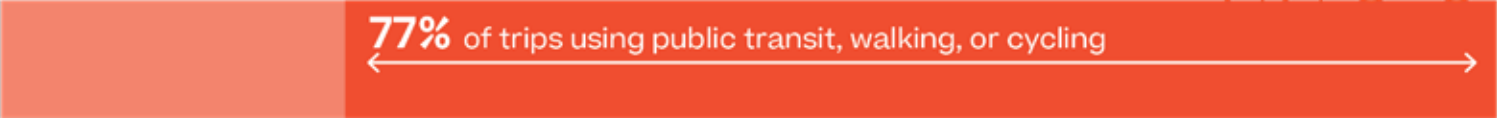
A climate-positive neighbourhood that cuts greenhouse gases by 89 percent

Housing affordability impact



A housing vision with 40 percent of units at below-market rates, supported by more than \$1.4 billion in new private funding sources

Mobility impact



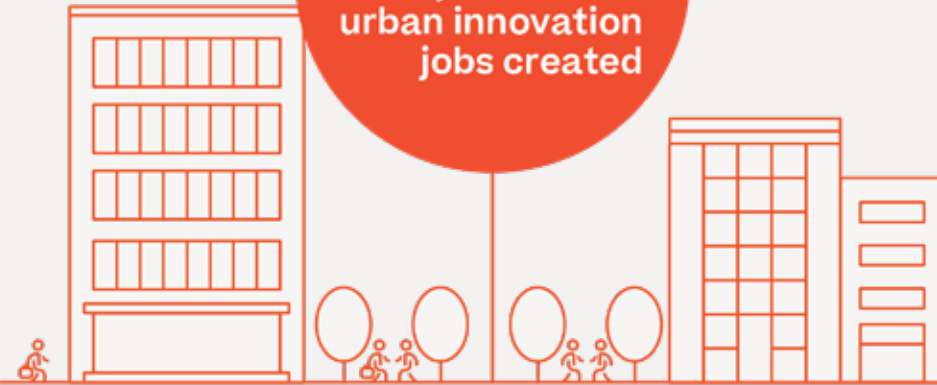
An estimated 77 percent of trips would use public transit or active modes, like walking or cycling

Urban innovation impact



A new innovation campus and economic cluster, with 10,500 jobs (of the 93,000 total) focused specifically on urban innovation

The ability to catalyze digital innovation while protecting privacy and the public good through a new standard of responsible data use



A Pivotal Moment for the Future of the Eastern Waterfront

The area’s lack of basic infrastructure and transit connections are a barrier — and an opportunity. Installing innovative systems across the proposed River District can provide the foundation to attract private development that would fully unlock the waterfront’s potential.

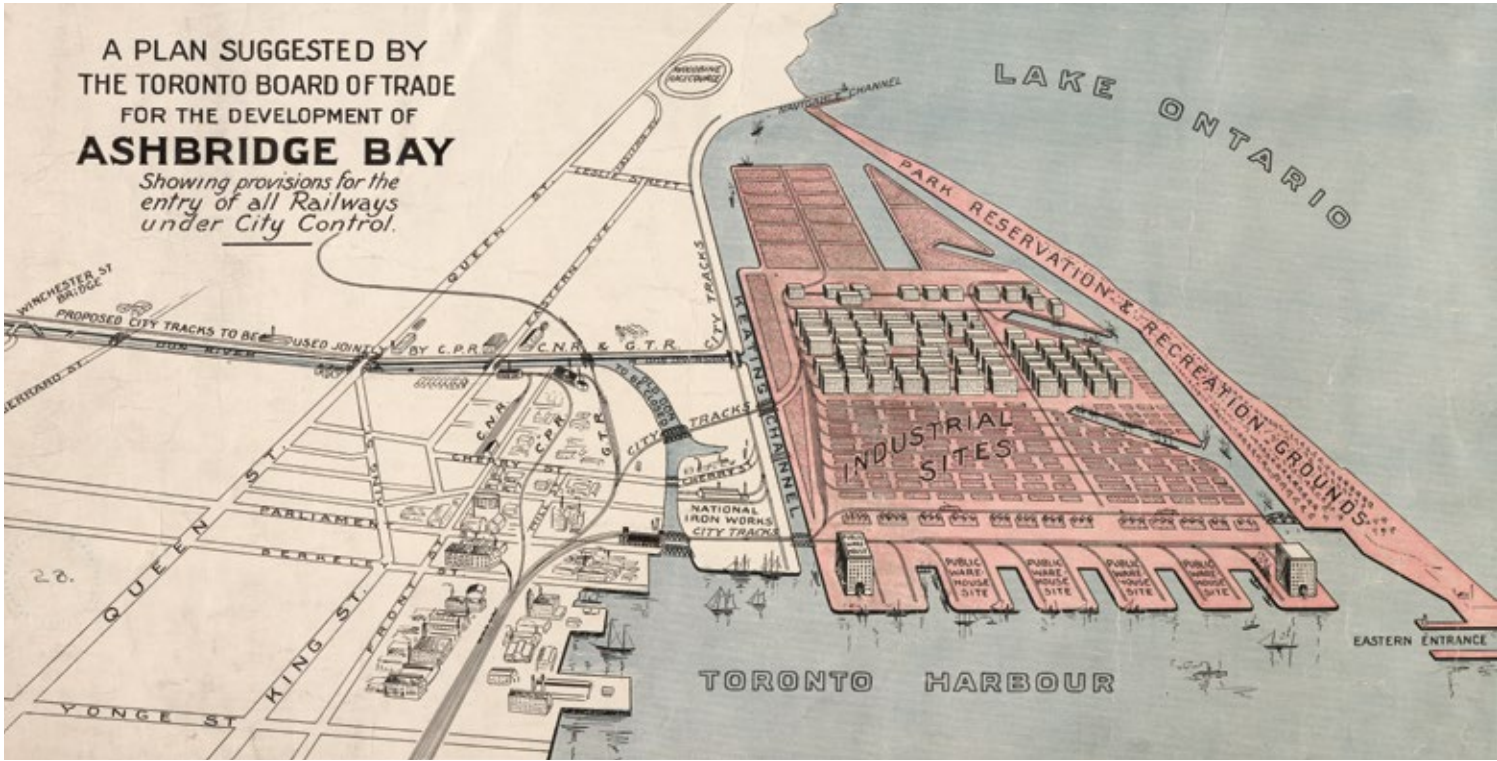
The River District history: Unfulfilled potential

In the early 1900s, civic leaders targeted what was then the marshy and highly polluted area at the mouth of the Don River, known as Ashbridges Bay, as a potential new centre for shipping, industry, and commerce.¹³

They created the Toronto Harbour Commission in 1911 with the goal of establishing a competitive port, filling in Ashbridge’s Bay with lakefill and constructing new quays, extensive dockwalls, and two new shipping channels that cut through the new land. In addition, plans were sketched out for parks, homes, beaches, and winding lagoons that could serve as living and recreational areas for residents.

But these ambitions were never fully realized, as the port never achieved the full anticipated growth.

After World War II, Toronto’s economy shifted away from manufacturing — as was the case in many cities across North America — leaving the waterfront’s industrial areas to enter a long period of decline and neglect. Today, beyond the important Film District, the eastern waterfront is largely a storage ground whose remaining industrial structures serve as a testament to the difficulty of large-scale urban development.



The Ashbridges Bay Development Plan — one of the earliest proposals for the eastern waterfront, from the Toronto Board of Trade in 1909 — envisioned Ashbridges Bay as an island encircled by shipping channels with rail-only access. Credit: Toronto Public Library

The River District today: Poised to fulfill its promise



In 2018, Waterfront Toronto began construction on a complex, \$1.25 billion plan to protect the Port Lands from flooding, taking a key step towards unlocking revitalization. Credit: DroneBoy

With the central waterfront district approaching completion, and the rezoning for the nearby East Harbour district approved, the eastern waterfront area has once again become a central focus of Toronto’s planning efforts. There is widespread recognition that this unique moment requires an ambitious and forward-looking approach to development.

As the city grows, the need for additional sustainable neighbourhoods, affordable housing, and space for growing industries has become more urgent. Whereas the Port Lands were once isolated and distant from the city’s core, today

new buildings on the waterfront have marched steadily eastward, with numerous projects completed and others currently under construction within a few blocks of Quayside.

Once again, Toronto’s planning efforts have focused on the potential of this area for economic development that can benefit the entire city. But a new generation of thinking, led by Waterfront Toronto, seeks a holistic approach that re-establishes natural systems and provides for a more sustainable and healthy kind of urban growth.

Planning spotlight

How the River District proposal adds value to the Port Lands Planning Framework

Released in 2017 by the City of Toronto and Waterfront Toronto, the Port Lands Planning Framework outlines a high-level vision for the future development of this area over a timeline of roughly 50 years.

By extending the innovative approach to planning initiated in Quayside and leveraging long-term resources, Sidewalk Labs can not only help achieve this vision but help to accelerate it and amplify many of its core components. At nearly 27 million square feet of development, the River District envisions a density with the potential to unlock a public transit expansion, dramatically increase the supply of affordable housing, and generate billions in tax revenue for the economy — achieving city and waterfront objectives years sooner than anticipated by the framework.

Some key areas where the River District proposal adds value to the Port Lands Planning Framework include:

Envisioning Villiers Island as a major economic hub.

The Port Lands Planning Framework identifies Villiers Island as mostly a residential mixed-use area. The River District proposal builds on this foundation by identifying the area as a potential major economic and employment hub anchored around an urban innovation campus, enabling the creation of a true live-work-make community and a significant revenue source for the city. (See Page 292 for more.)

Preparing for self-driving vehicles.

The framework envisions the creation of a balanced mobility system that emphasizes public

transit, walking, and cycling. The River District proposal complements that approach by designing adaptable streets that anticipate the safe arrival of self-driving vehicles operating as a shared service, dramatically reducing the need for residents and workers to own a car and enabling a significant amount of road and parking space to be reclaimed for public space. Additionally, the potential for self-driving vehicles to operate as electric vehicles is a significant component of the path toward climate positivity.

Developing advanced energy infrastructure.

The framework calls for innovations and infrastructure that can help realize a climate-positive community but does not identify the advanced systems needed to achieve it. The River District proposal introduces a comprehensive approach towards climate positivity through advanced infrastructure systems (identified on Page 322) supported by digital energy management tools.

Planning for greater density to unlock a transit expansion and sustainable development.

The River District proposal envisions a greater scale of density than commonly assumed for the Port Lands Planning Framework (particularly in Polson Quay), characterized by a mixture of residential uses alongside non-residential uses such as retail, office, community, and production. Greater density unlocks the ability to finance sustainable infrastructure, such as the transit expansion (see Page 352) and improves affordability through the delivery of a significant supply of below-market housing (see Page 389).

Expanding the supply of affordable and below-market housing.

The River District proposal strives to exceed current waterfront requirements for housing affordability by promoting a housing vision defined by 40 percent below-market units. This vision targets 20 percent of housing units for middle-income households that currently do not qualify for affordable housing and envisions half of all units being purpose-built rentals to improve long-term affordability. The proposal also outlines paths for developers to support ambitious public goals for affordable housing, including through the use of new financial tools and efficient unit designs that can create new value that can be applied towards below-market programs (see Page 386).

Accelerating the development timeline.

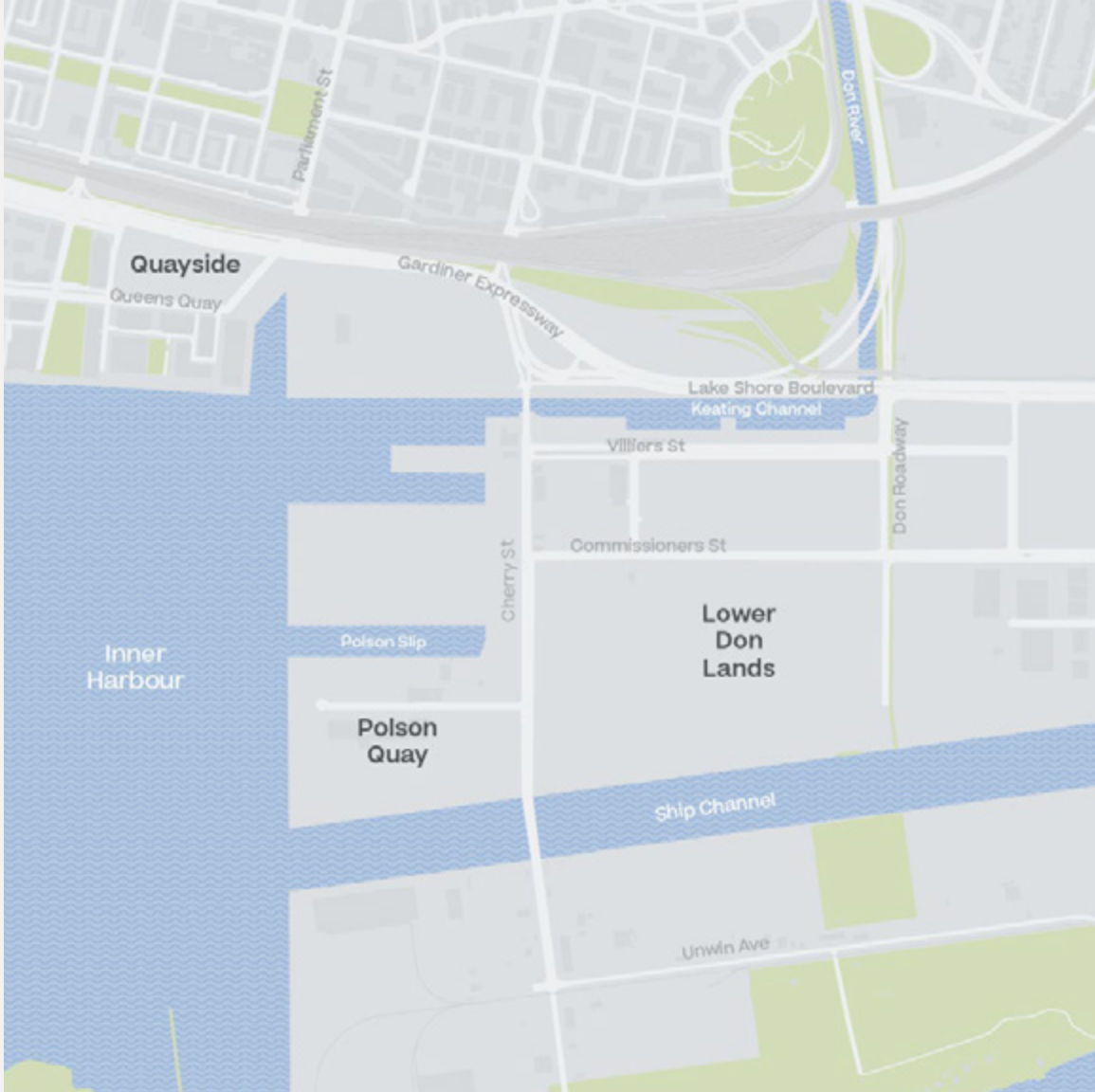
The Port Lands Planning Framework considers the area’s evolution across a period of roughly 50 years. The River District proposal leverages private-sector resources to help deliver more than 30 percent more square feet of development on a timeline 10 years faster than the current plan. (The full IDEA District proposal would produce 32.8 million square feet of development by 2040, versus a baseline scenario of 24.4 million square feet by 2050.) The IDEA District has the potential to generate an enormous annual benefit to the Canadian economy, including over 93,000 jobs, \$14.2 billion in annual economic output, and \$4.3 billion in annual tax revenues. (See the “Economic Development” chapter of Volume 1.)

Map

Port Lands Flood Protection Project: Creating Villiers Island

Before:

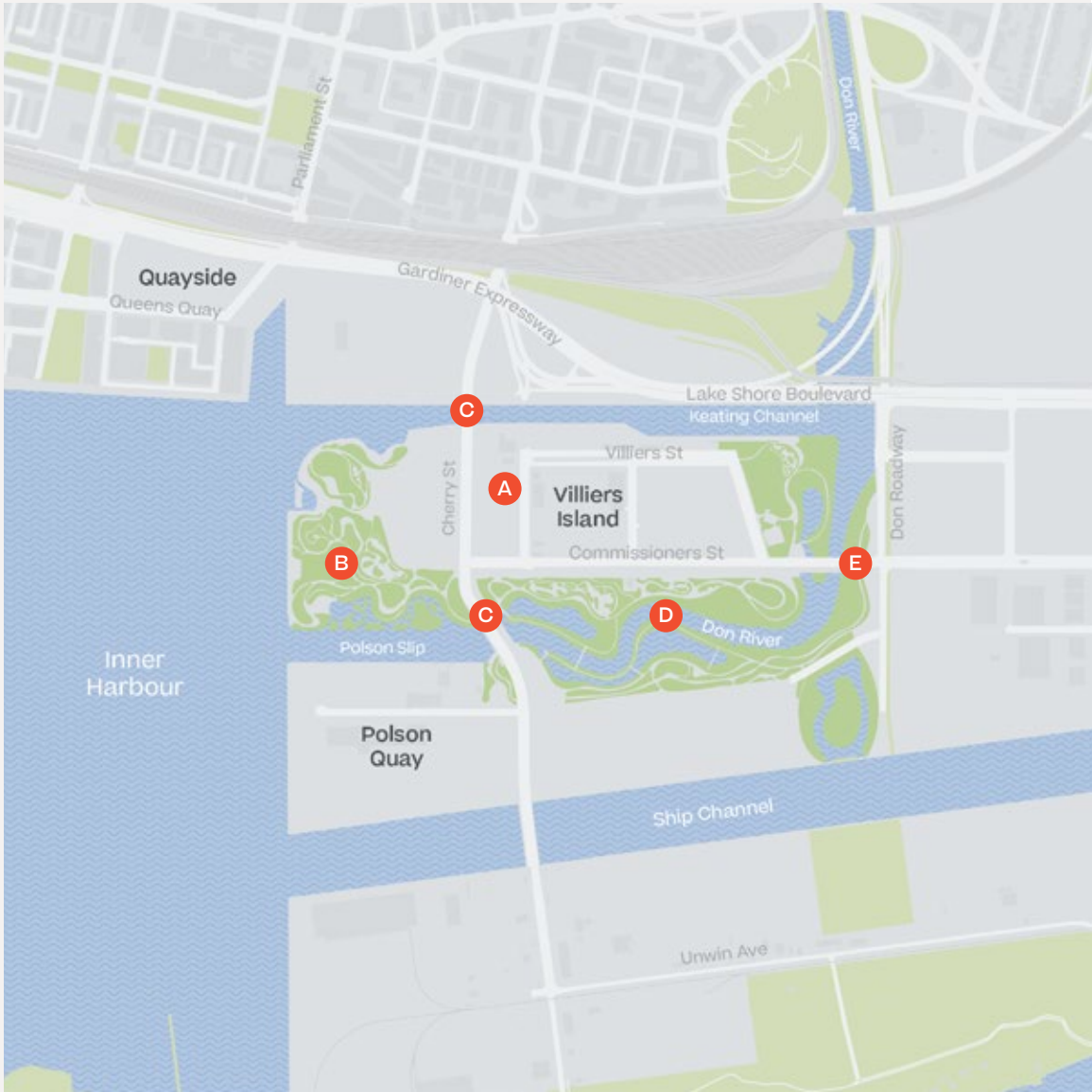
The Port Lands today



After:

The Port Lands after the flood- protection project

- A** Creation of Villiers Island
- B** Establishment of new park system
- C** Construction of new bridges at Cherry Street
- D** Renaturalization of Don River
- E** Construction of new bridge at Commissioners Street



The Port Lands Planning Framework lays out a vision to transform these industrial lands into an economic and innovation hub that adapts to changing conditions, enjoys ubiquitous connectivity, respects the waterfront context, and creates a network of dynamic new neighbourhoods. “Over the coming decades, the Port Lands will transform from a predominantly industrial district into a modern and vibrant extension of the urban metropolis,” reads the framework. “The Port Lands will be a showcase for innovation and a leader in environmental performance.”¹⁴

At a similar size as downtown Toronto, the Port Lands can be reimagined not simply as a series of new live-work communities on the water but as an expansion of the central city itself — with a full and diverse range of innovative areas for working and production that allows the Toronto economy to grow and prosper.

The Port Lands Flood Protection Project: Setting the stage for development. In 2018, Waterfront Toronto began construction on a complex, \$1.25 billion plan to protect large southeastern portions of downtown Toronto, including significant portions of the Port Lands, from flooding. Funded by all levels of government, this investment aims to unlock the Port Lands for revitalization, to enable the creation of new communities, to improve Toronto’s resiliency in response to the growing impacts of climate change, and to lay the groundwork for economic development.

The design concept for the project was the result of an international competition led by Waterfront Toronto, which challenged respondents to think differently about natural systems, public space, and development.¹⁵ As a result, the project takes a highly innovative approach to providing flood protection.

For example, rather than rely exclusively on traditional “hard” concrete infrastructure (such as dockwalls, channels, and pipes) to manage water, the project envisions a renaturalized riverbed that allows the Don River to flow through newly created wetlands and natural habitats configured to allow for expansion of the riverbed during floods and for contraction during normal times. The project is scheduled to be completed in 2024.¹⁶

While the investment in the Port Lands Flood Protection Project is extraordinary, it is only a first step. Substantial additional investments are required to fully unlock the area’s potential. The lack of modern infrastructure and questions over how to finance it create a formidable barrier to any kind of development, let alone the standard-setting communities envisioned by Waterfront Toronto and the City of Toronto in the Port Lands Planning Framework.

The River District tomorrow: Infrastructure to meet future needs

Over the coming years, substantial investments in infrastructure will be required at the Port Lands well beyond the flood protection work, and the results will determine the future of the waterfront.

The infrastructure developed nearly a century ago to support an industrial centre is not up to the demands of a modern mixed-use district hosting tens of thousands of workers, residents, and visitors. As a result, the eastern waterfront requires entirely new systems for transportation, energy, information technology, water, freight, and waste.

The standard approach to new development would suggest extending the existing infrastructure along the waterfront into the Port Lands, and incrementally

building it for each new neighbourhood as it develops. But this approach would forfeit an extraordinary opportunity to think holistically about the potential of the eastern waterfront to implement a more sustainable, integrated, and forward-looking set of urban systems that can achieve the city's goals of climate-positive neighbourhoods and new mobility infrastructure, while building in flexibility to meet the needs of future generations.

If implemented, these systems would fuel economic development, empowering Toronto as a driver of innovation, supporting local companies, and attracting investment from around the globe.

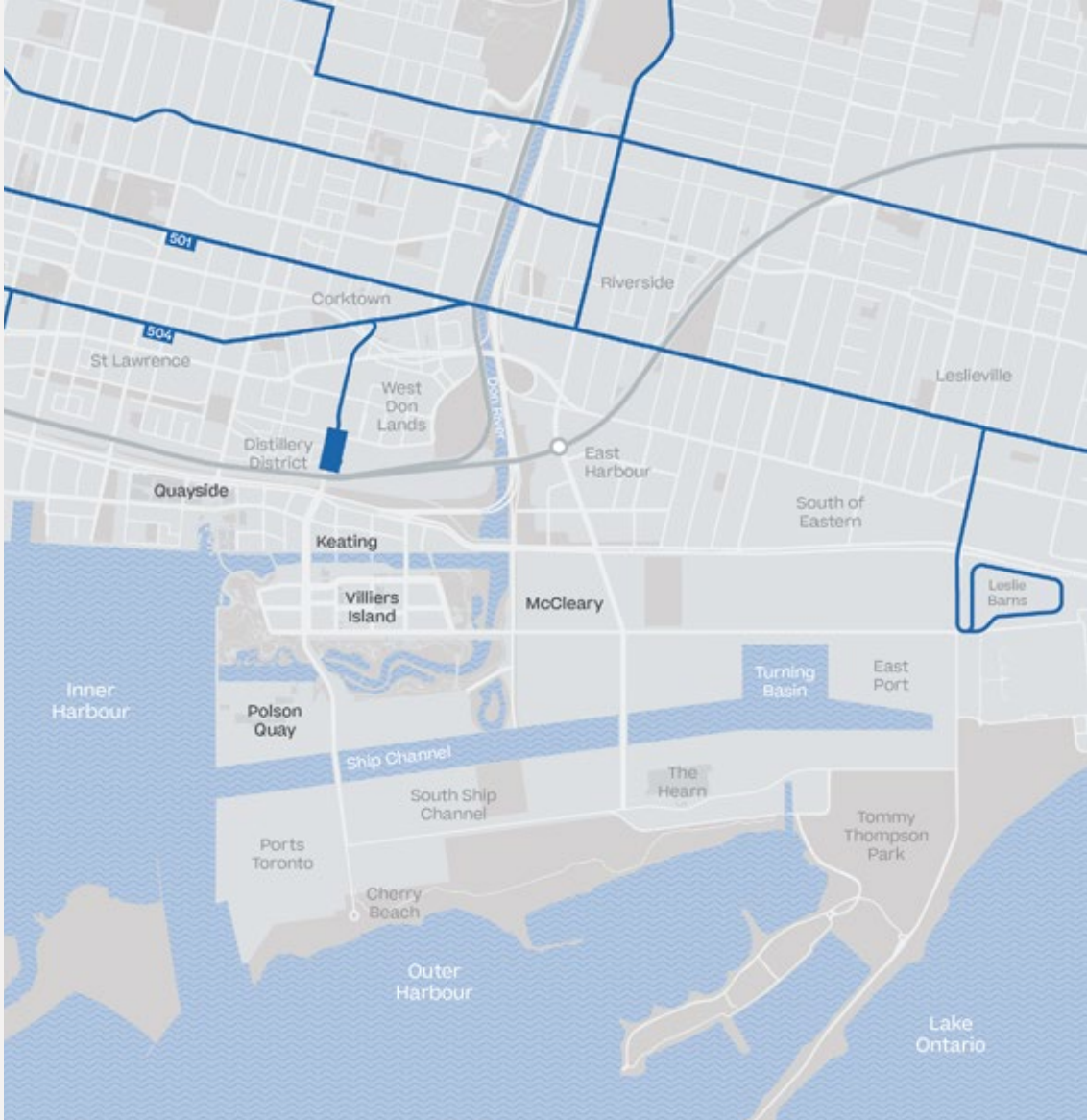
East end of Keating Channel, looking south-west.
Credit: City of Toronto Archives



Map Rapid transit connections in the eastern waterfront

Before: Light rail network today near the eastern waterfront

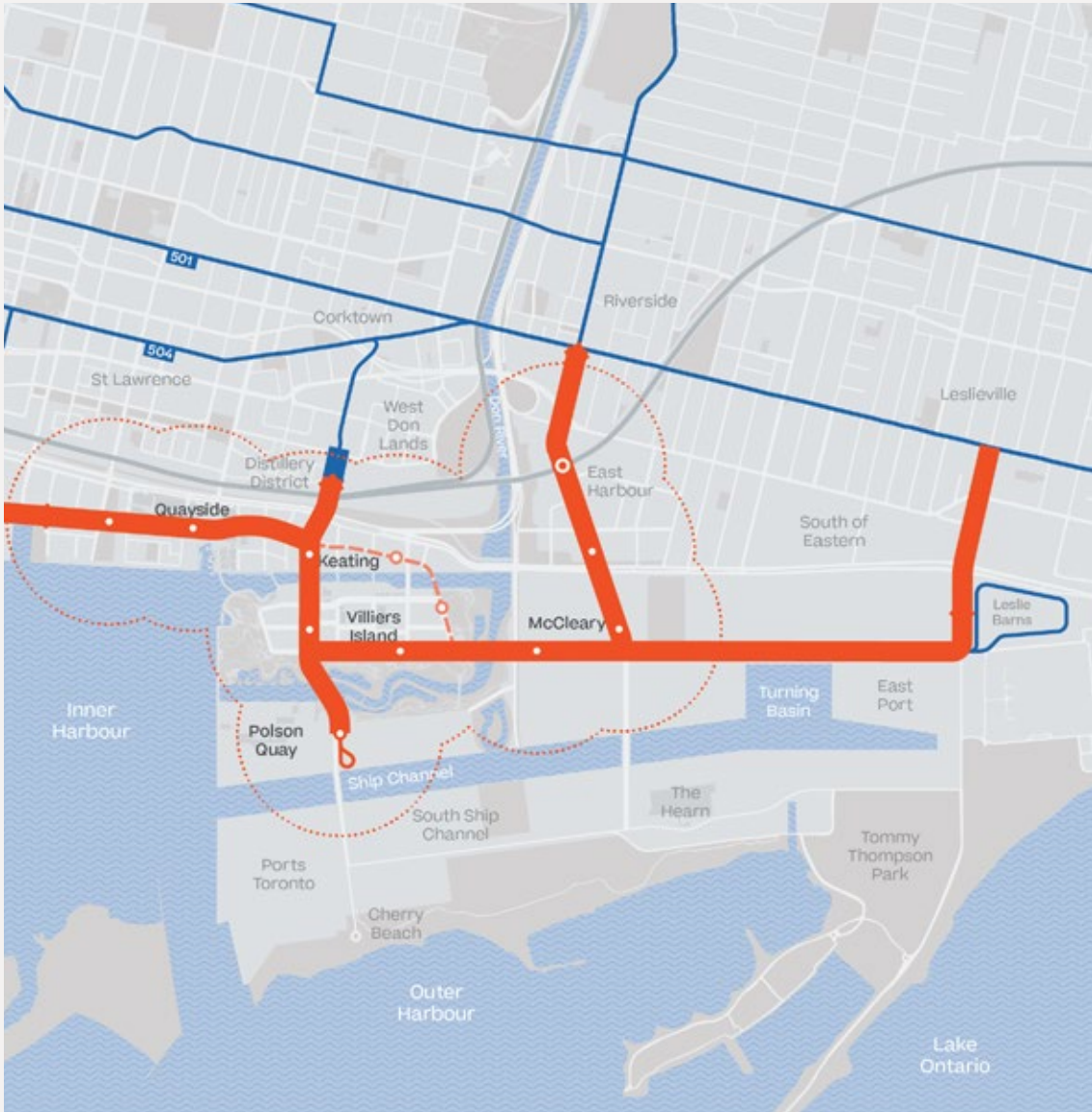
GO Transit / SmartTrack
Existing light rail



After: Light rail expansion into the eastern waterfront

GO Transit / SmartTrack
Existing
Approved extension
Optional
5-minute walk from new stops
Planned East Harbour Station
Light rail

0 500 Metres



The River District Can Anchor a Renewed Eastern Waterfront

Collectively, five distinct neighbourhoods have the potential to form a spectacular district driven by innovation, including a new Google Canadian headquarters and an Urban Innovation Institute.

Spanning 62 hectares, the proposed River District would encompass five distinct neighbourhoods surrounding the renaturalized Don River: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay. These neighbourhoods would be carefully stitched into their surrounding environments, including extending the innovation corridor along Queens Quay and into Quayside.

These are the only areas within the Port Lands Planning Framework that have been identified as appropriate for

mixed-use growth. Consistent with the framework, Sidewalk Labs envisions them as complete communities that integrate residential and recreational uses alongside significant urban innovation jobs focused on production, interactive, and creative industries.

Sidewalk Labs believes that applying new technologies and approaches can foster even more jobs and businesses than a

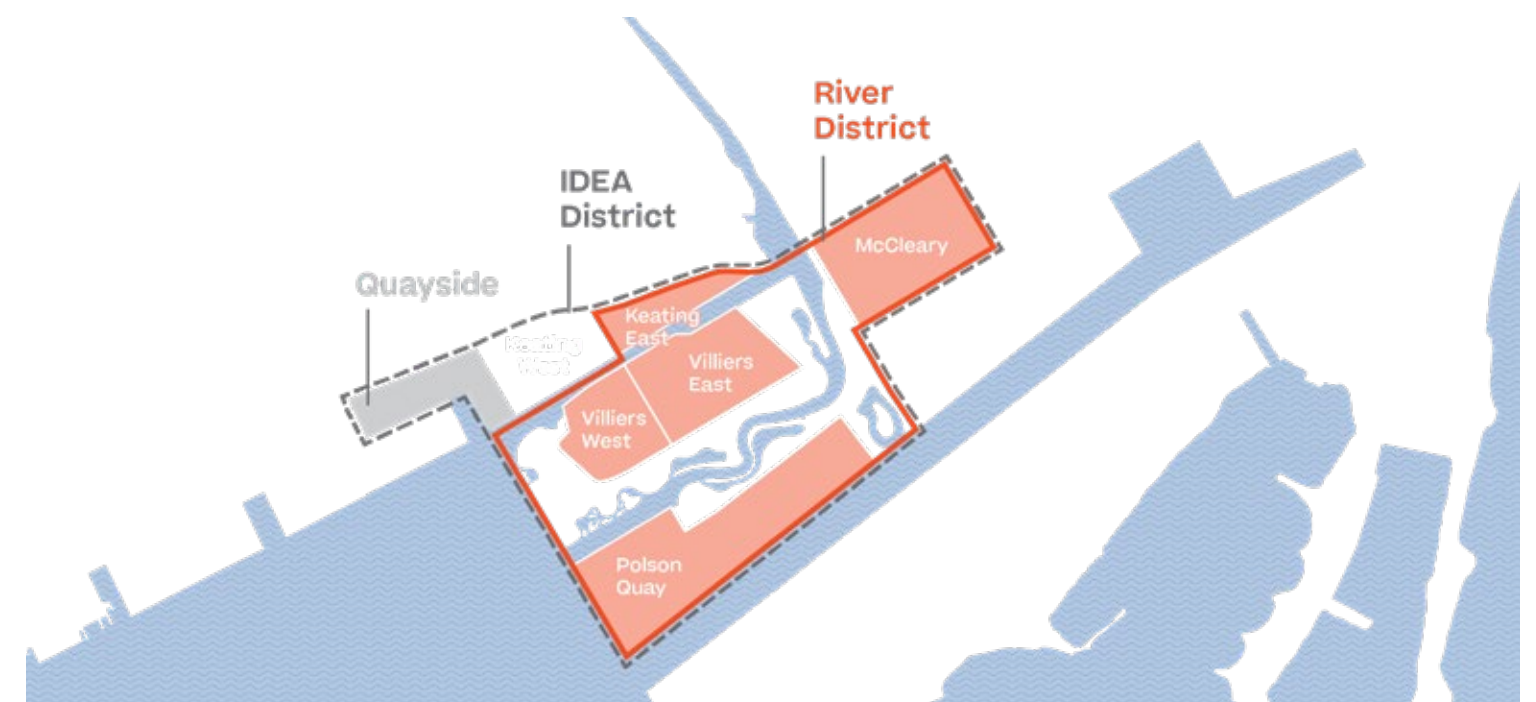
traditional mixed-use development while providing a higher quality of life for workers, visitors, and residents.

To name just a few examples: new flexible building types, coupled with outcome-based building-code systems, can expand the types of non-residential uses that can coexist in a neighbourhood and strengthen opportunities for true live-work-make communities. New mobility networks that are reliant on public transit and active modes, along with dense housing (including a 40 percent below-market program) adjacent to job centres, can provide a level of convenience and sustainability across the district. Extending the light rail can accelerate the pace of development in significant ways, especially when coupled with digital design

and fabrication strategies for buildings, bringing benefits to Toronto sooner than originally anticipated.

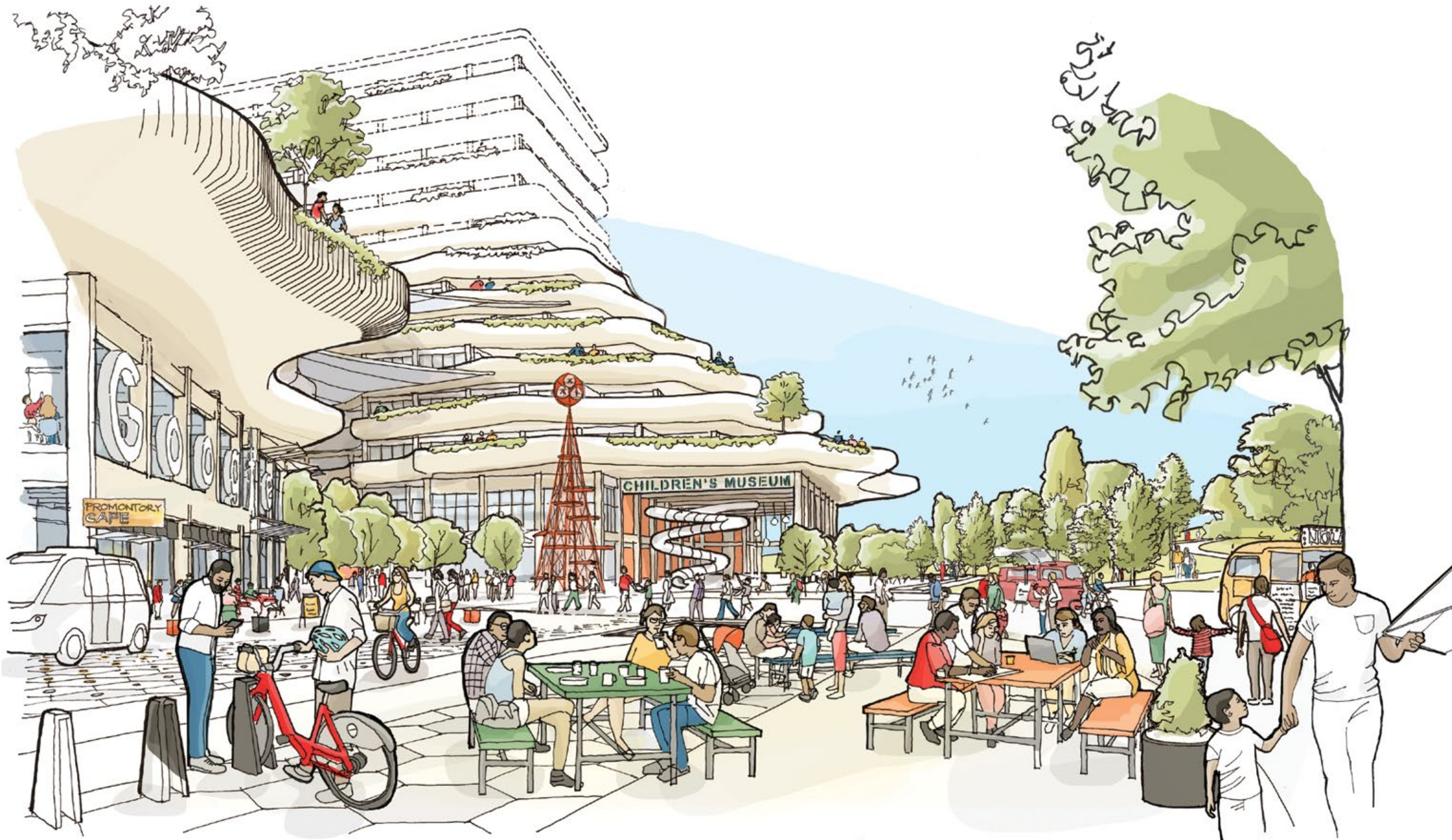
A key focus for these neighbourhoods would be support for existing industries, such as the film industry. That support could include housing options geared towards the labour-force demands of the area, such as workers supporting the film studios.

The creation of an IDEA District anchored by an innovation campus can create an ecosystem of people and businesses continually generating and implementing new ideas to improve urban life. The River District has the potential to become the globally recognized centre where urban innovations emerge, grow, and flourish.



Villiers West

The 7.75-hectare western half of Villiers Island has the potential to catalyze economic development across the region, anchored by the new Google Canadian headquarters and an Urban Innovation Institute designed to connect seamlessly with the new Promontory Park. Sidewalk Labs proposes to act as the vertical developer for this area in concert with local development partners.



This illustration shows the Villiers West innovation campus and Promontory Park.

Villiers East

The 11.5-hectare eastern half of Villiers Island offers an exceptional opportunity to create an inviting, walkable live-work community. In addition to jobs, Villiers East could be filled with affordable housing options, retail and other ground-floor uses, and a new pedestrian-first street network designed to create a series of intimate walkways and courtyards, all encircled by a magnificent new park created as part of the flood protection work.

In this area, and for the rest of the River District, Sidewalk Labs would play a supporting role as Innovation and Funding Partner, while Waterfront Toronto and the City of Toronto work with other partners to undertake development.

A conceptual illustration of a Villiers East Accessway and plaza, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Keating East

The planned relocation of the Gardiner Expressway will create the opportunity for a new six-hectare neighbourhood along the reclaimed Keating Channel. The Port Lands Planning Framework envisions the channel as the centrepiece of the surrounding neighbourhoods.

Sidewalk Labs embraces this vision and believes that the spirit of innovation animating the adjacent innovation campus can become a driving programmatic force for the channel. A Keating Channel exploration zone could become a dynamic, water-focused spine that showcases groundbreaking work across arts, culture, and production.

Taller buildings along the highway could scale down as they approach this intimate waterway, establishing the canal as a unique place in Toronto with vibrant public space and development on both sides of the water. Multiple new pedestrian and bike bridges are proposed across the channel, creating a character similar to the canals of Amsterdam.

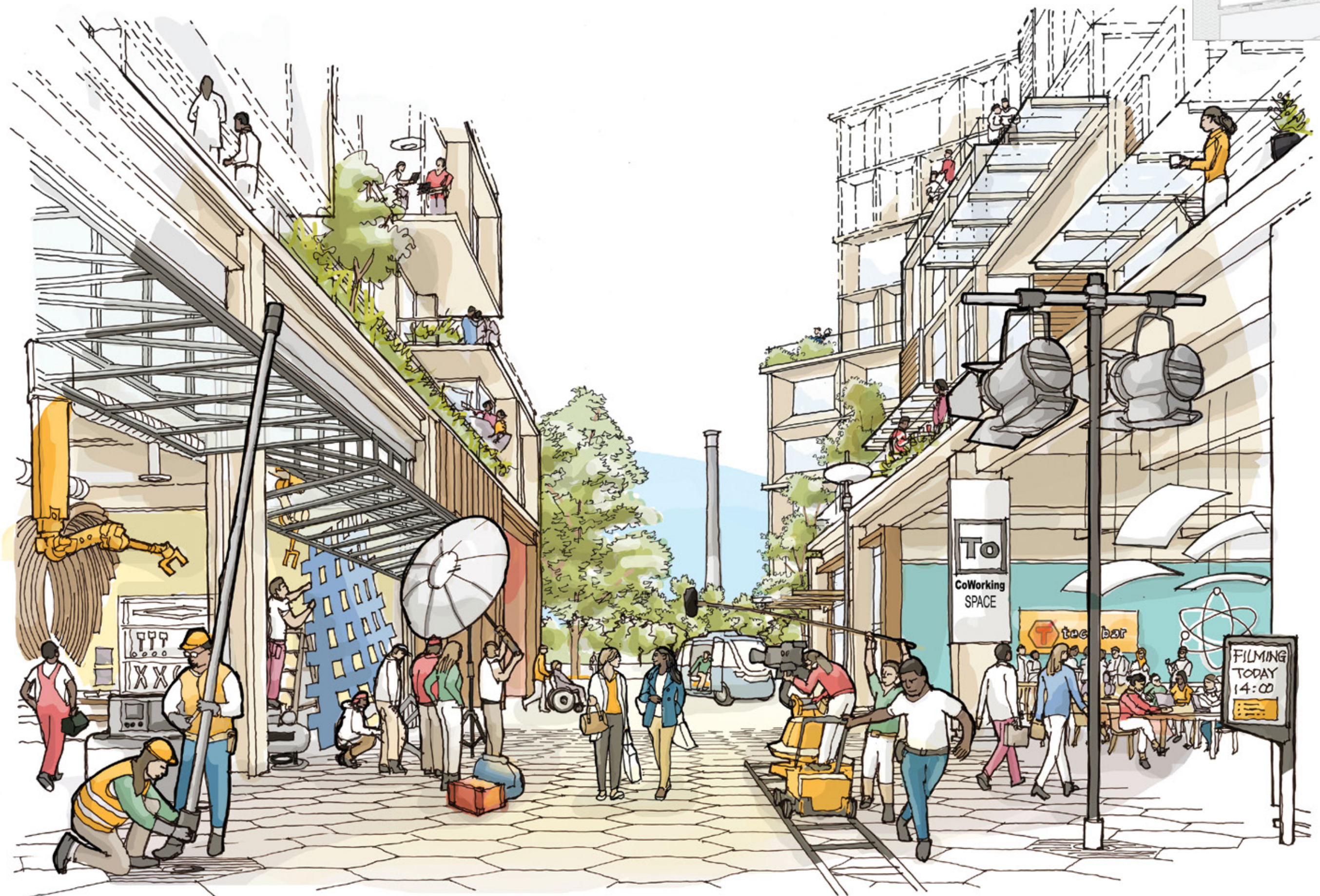
A conceptual illustration of Keating Channel, looking west, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Consistent with the Port Lands Planning Framework's direction as a mixed-use area focused on production, interactive, and creative industries, the 14-hectare McCleary District could integrate dense housing with commercial space that complements East Harbour and the Film District, with spaces equipped to support production shoots and new economy companies, startups, micro-enterprises, and creative industries.

Located within short walking or biking distance of the Film District, East Harbour, and the innovation campus on Villiers Island, McCleary could become an ideal residential location for people with jobs in the neighbourhood and nearby. In addition, a new light rail stop located on Commissioners Street would ensure access to major transportation hubs and downtown Toronto.

A conceptual view of a future street in McCleary, looking east to McCleary Park, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Polson Quay

Polson Quay encompasses both the Polson Quay and South River areas identified in the Port Lands Planning Framework. Establishing connections to the rest of the city will be critical to the growth of this 23-hectare neighbourhood, located south of Villiers Island and along the south side of the newly naturalized Don River.

As in Villiers Island, a series of bridges in Polson Quay could form important links to the surrounding city, including space for a light rail extension with a new stop in the centre of the neighbourhood. With these key investments in place, Polson Quay can take full advantage of its geography and dramatic views of the harbour and city skyline to become a place where production, interactive, and creative uses can coexist in an integrated way with housing, commercial activity, community spaces, and an accessible public realm — achieving a unique live-work-make waterfront neighbourhood.

A conceptual view of Polson Quay, looking north to downtown, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Neighbour- hood Planning Concepts

The following section describes Sidewalk Labs development proposal for the Villiers West area of the River District, where it would assume the role of real estate developer in concert with local development partners.

This section also describes visions for the other four neighbourhoods that would make up the district, where Sidewalk Labs would play the role of Innovation and Funding Partner.

The River District Program

The River District can become a major economic engine for the eastern waterfront while integrating employment, residential, commercial, cultural, and public spaces to become a vibrant urban district.

The Port Lands Planning Framework provides the roadmap for the transformation of the area surrounding the renaturalized Don River from a formerly industrial area to a modern, vibrant, mixed-use urban community. The framework has broad goals, envisioning the creation of “vibrant districts with unique and memorable local identities that promote social interaction, cultural enrichment, ecological health, a low-carbon future, and a prosperous local economy.”

Sidewalk Labs believes that this ambitious vision can be substantially advanced within the River District’s five distinct neighbourhoods: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay.

Collectively, they can form the world’s most innovative urban district, generating thousands of jobs, creating walkable live-work communities that are exhilarating and welcoming in equal measure, and setting new global standards for sustainability.

The River District consists of the same areas within the Port Lands Planning Framework that have been identified as appropriate for mixed-use growth. As described on Page 275, Sidewalk Labs proposes to accelerate development within the River District and to significantly expand the benefits of such development.

Anchored by an innovation campus, the River District would create the conditions for ongoing research and innovation, fostering an ecosystem of people and businesses that continually implements new ideas aimed at improving urban life. It would be supported by advanced infrastructure that makes climate positivity possible, a reconceived mobility network that provides a balanced set of mobility options, and digital infrastructure that helps to bridge the digital divide and facilitate innovation by an array of third parties.

These innovations would allow the development to occur years faster than is currently anticipated and create neighbourhoods that can support higher densities, like Polson Quay, without sacrificing open space or quality of life.

The River District proposal leverages private-sector resources to help deliver more than 30 percent more square feet of development on a timeline 10 years faster than the current plan. (The full IDEA District proposal would produce 32.8 million square feet of development by 2040, versus a baseline scenario of 24.4 million square feet by 2050.)

Key Term
Stoa spaces
(found on the lower two floors) are designed to accommodate a wide range of uses beyond traditional retail, helping to activate the street.

Establishing a new regional economic anchor.
The River District development program proposed by Sidewalk Labs would be anchored by a new innovation campus located on the western edge of Villiers. This campus would be catalyzed by a new Google Canadian headquarters and the applied research focus of the Urban Innovation Institute, driving thousands of jobs

across the eastern waterfront and attracting new companies to create a global hub for creative and innovative industries.

The innovation campus and broader ecosystem of urban innovation would complement the Film District expansion to the east and the East Harbour development to the north, providing another strong economic driver of economic expansion throughout the Port Lands.

Integrating production spaces.
The Port Lands Planning Framework designates Polson Quay and McCleary as mixed-use areas focused on production, interactive, and creative industries. Such areas are intended to enhance and expand the local economy and ensure Toronto remains a place for creativity and innovation by fostering growth in Toronto’s film industries, interactive and digital media, and art and design.

With key economic anchors in place, and new investments in transportation, infrastructure, and public parks, the River District can be an attractive place to live, work, and visit, with a striking mix of uses throughout its neighbourhoods.

New production and workshop facilities, enabled by Sidewalk Labs’ unique lower-floor stoa spaces, can be located throughout the district, strengthening the commitment to a diversity of uses and providing additional opportunities for small businesses that build off new technologies and capabilities.

The River District
could be home to
34,000
new housing units.

Supporting new live-work communities.
One highly attractive feature of urban living is the ability to live and work in the same neighbourhood. This opportunity has been appreciated by generations of Torontonians but is increasingly difficult to achieve as downtown living gains in popularity and residential uses compete with commercial and office uses.

Providing housing opportunities on parcels adjacent to employment centres enhances the ability of the employment spaces to succeed and provides a diversity of job opportunities for different income groups.

With a housing vision that could produce around 34,000 new housing units (including 40 percent of units at below-market rates), the River District can make a significant contribution to achieving Toronto’s affordable housing goals, leveraging new private funding sources alongside additional government support.¹⁷ And with the scale of the River District, new and creative housing types can proliferate, providing a wide range of housing options for individuals and families at different stages of life.

Fostering more ground-floor diversity.
With thriving commercial centres, a large local population, and safe, walkable streets, the River District would become an attractive place for retail and entertainment. Flexible lower-floor stoa spaces can be expanded across the River District, increasing opportunities for entrepreneurs to explore new ideas and for residents to enjoy a wider and

ever-changing series of retail choices. The flexibility of the stoa model also provides space for artists, cultural organizations, and small businesses to become a significant and defining feature of these new neighbourhoods.

Incorporating social infrastructure into the foundations of new communities.
A key feature provided by the stoa model is the opportunity to incorporate social infrastructure facilities at multiple locations throughout a neighbourhood, rather than to set aside separate parcels of land. At the scale of the River District, a wide variety of health, educational, and civic facilities can form a true network of social infrastructure, increasing access to services and opportunities for residents and workers.

Drawing people outdoors more of the time.
By planning for a diversity of flexible spaces and designing streets to increase space for the public realm, the River District could become home both to more open space and to a greater variety of space than previously planned. Nature could be integrated into streets; water could be not only accessible but also part of everyday life; pedestrian-friendly courtyards could open onto plazas full of busy cafés and connect residents and workers to a vast network of parks. The variety of uses could draw ever more people into the public realm, which would act as the backbone of local civic life and as a backyard for families.



Key facts:
Villiers West

Development timeline
2023–2027

Size
7.8 hectares

Total area
Roughly 2.75 million square feet

The proposed innovation campus in Villiers West would be planned and designed as a public place that is fully integrated into the neighbourhood fabric.

The location on the edge of Villiers Island would benefit new companies but also comes with a civic responsibility to ensure this extraordinary space is fundamentally public, open, and welcoming to all.

The Villiers West innovation campus





Villiers West would feature a Centre Street pedestrian walkway (shown here, looking west towards Promontory Park).

The proposed program for the River District would create a significant new addition to Toronto’s existing network of vibrant, mixed neighbourhoods in and around downtown. Unlike many recent new developments that have focused heavily on residential development, the River District program is consistent with the land-use designations contained in the Port Lands Planning Framework.

This program takes the mixed-use goal further by proposing a major new economic hub for Villiers West and more

overall development (although densities are not specifically prescribed in the framework and are left to the pre-cinct planning stage). Both are positive changes that provide a major economic benefit to the city.

These levels of density are critical to finance the public transit extension needed to unlock sustainable development, as well as to support the creation of other municipal and advanced infrastructure systems.

Villiers West: Creating an Economic Hub Within a Thriving New Neighbourhood

Home to a new innovation campus, including a new Google Canadian headquarters, Villiers West can become the economic anchor of the River District, helping to generate 93,000 total jobs across the full IDEA District.

	Residential	Commercial	Retail / Production	Social infrastructure	Total
Land use program (in square feet)					
Villiers West	1,150,000	1,400,000	150,000	50,000	2,750,000
	42%	51%	5%	2%	100%
Villiers East	3,400,000	500,000	200,000	50,000	4,150,000
	82%	12%	5%	1%	100%
Keating Channel	2,250,000	850,000	250,000	100,000	3,450,000
	65%	25%	7%	3%	100%
Polson Quay	7,350,000	1,800,000	450,000	150,000	9,750,000
	75%	18%	5%	2%	100%
McCleary	4,550,000	1,750,000	300,000	100,000	6,700,000
	68%	26%	4%	1%	100%
Total	18,700,000	6,300,000	1,350,000	450,000	26,800,000

Note: Percentages may not add up due to rounding. Table reflects the magnitude of development (in gross square feet for the River District).

Building an economic cluster around urban innovation

As further described in the “Economic Development” chapter of Volume 1, Sidewalk Labs plans to help catalyze an economic cluster focused on urban innovation. This effort defines urban innovation as going beyond the mere pursuit of urban efficiencies associated with the “smart cities” movement, towards a broader set of digital, physical, and policy advances that enable government agencies, academics, civic institutions, and entrepreneurs both local and global to address large urban challenges.

Anchored by a new Google Canadian headquarters and an Urban Innovation Institute, this cluster would build on Toronto’s leadership in areas such as artificial intelligence and other technology specialties while supporting the growth — and invention — of new cutting-edge industries.

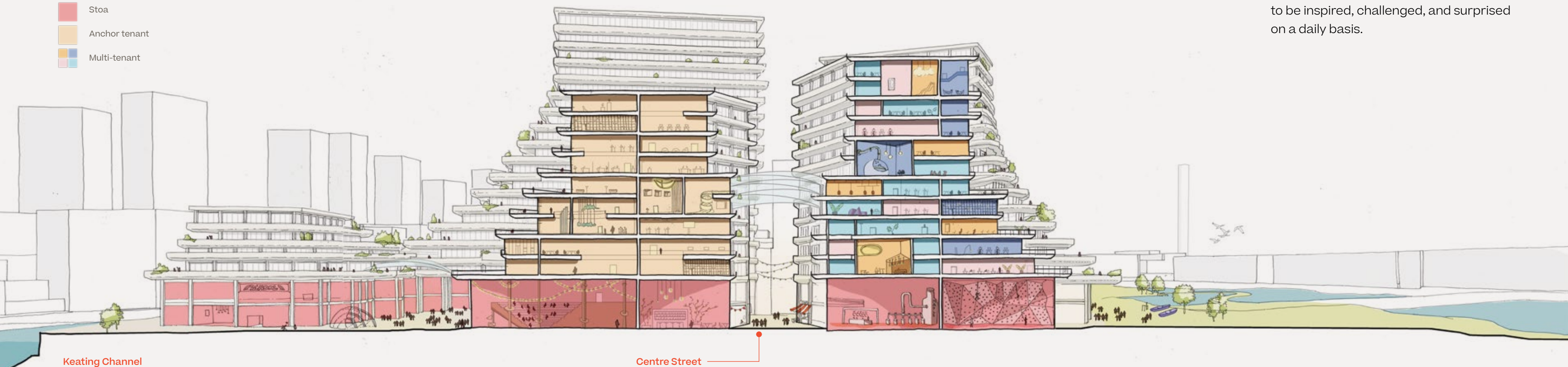
Villiers Island is uniquely situated to foster this kind of development. The proposed innovation campus would be located on the dramatic western edge, next to a new light rail stop, with enough space to accommodate new companies, start-ups, and institutions as the cluster grows. To the east, thousands of units of housing could be interlaced with retail, community, and cultural spaces, attracting companies seeking a high quality of life for their employees, who would be able to walk to work along the island’s innovative and intimate pedestrian-first street grid.

to the west in Promontory Park, which will offer spectacular views of the harbour and downtown skyline. To the north, Sidewalk Labs proposes to reinvent the Keating Channel — an artificial waterway lined with a series of industrial buildings — with repurposed historic structures and new pedestrian, public transit, and cycling bridges stitching together both sides of the canal, supporting a new creative economy centred around the arts, production, and exploration.

These diverse experiences could fuel each other, drawing workers and residents united by a shared commitment to exploring new ways of thinking, an excitement about the future, and a desire to be inspired, challenged, and surprised on a daily basis.

Cross section of the innovation campus

- Stoa
- Anchor tenant
- Multi-tenant





See the “Economic Development” chapter of Volume 1, on Page 420, for more details on plans to ensure that prosperity does not sacrifice equity or affordability.

The innovation campus would become the heart of a broader innovation ecosystem that extends across the Port Lands, building on Waterfront Toronto’s progressive work along the central waterfront; the bold thinking shaping the future of Quayside; and the innovation partnership between Toronto and Sidewalk Labs, which has the potential to set new standards for leveraging technologies to improve quality of life.

Anchoring the campus with a new Google Canadian headquarters.

To anchor this campus and catalyze this economic cluster, Alphabet commits to establishing a new Canadian headquarters for Google on the western edge of Villiers Island, as part of an agreed-upon transaction within the IDEA District.

Alphabet would target up to 500,000 square feet, which would be sufficient to accommodate as many as 2,500 jobs, the majority of which would be for Google employees (though actual hiring would depend on market conditions and business requirements).¹⁸

Fundamental to Google’s approach is the concept of a connected campus that encourages collaboration with neighbouring businesses, institutions, and communities. In the past, this approach has included maintaining active partnerships with local universities and supporting an emerging ecosystem of new small businesses, startups, co-working spaces, and anchor tenants.

Google’s arrival into an area has also supported the growth of local job and real estate markets. A Sidewalk Labs study of several U.S. cities found that Google’s arrival correlated with an increase in office value in the area, as well as an uptick in the local retail and residential inventory of 20 to 108 percent, above and beyond that of the rest of the city. In Chicago for example, the Fulton Market area experienced a 108 percent increase in office inventory, while growing office space value by 5.7 percent.¹⁹

More broadly, high concentrations of tech employment in cities have been demonstrated to increase the overall number of non-tech jobs as well, amounting to approximately five new non-tech jobs for every new tech job created.

Creating an Urban Innovation Institute to support Toronto’s leadership in this emerging field.

Additionally, Sidewalk Labs plans to work with universities and research centres to establish an Urban Innovation Institute — an applied research institute designed to bring together a wide cross-section of researchers, designers, engineers, and entrepreneurs to collaborate on ideas and technologies that drive urban innovation.

This emerging discipline studies how new technologies like ubiquitous connectivity, machine learning, sensing technology, and digital fabrication, along with new approaches to physical design, can help cities tackle tough challenges — leading to a projected market value of \$2 trillion

By the numbers:
→ Google Canadian headquarters up to 500,000 square feet
→ \$10 million in seed funding for new Urban Innovation Institute
→ \$4.3 billion in annual tax revenues by 2040

for the sector by 2025.²⁰ Toronto’s institutions are already leaders in the field, with more than 200 faculty and researchers dedicated to studying urban innovation and related areas of study at the University of Toronto alone.²¹

Envisioned by Sidewalk Labs as an independent non-profit, the Urban Innovation Institute can build on this progress. Sidewalk Labs would seek to work with Waterfront Toronto and local academic institutions to develop the plans and provide funding to support various development stages. Given the importance of the Urban Innovation Institute to the urban innovation ecosystem envisioned for the River District, Sidewalk Labs is prepared to provide \$10 million in initial seed funding (to be administered by an entity to be agreed-upon during the planning process), as well as to facilitate the provision of physical facilities for the institute within the Villiers West innovation campus.

Catalyzing development across the region.

This critical mass of innovative businesses animating the waterfront can attract more companies of all sizes seeking an environment that will spark new ideas, provide new opportunities for collaboration, actively support exploration, and inspire breakthroughs that lead to transformative change. As a result, this technology cluster could expand beyond the waterfront as Toronto builds on its burgeoning reputation and establishes itself as the intellectual capital for urban innovation.

As described further in the “Economic Development” chapter of Volume 1, a new Google Canadian headquarters on Villiers West can strengthen the growth of an innovation corridor between Toronto and Kitchener-Waterloo, which is home to a rapidly growing hub for technology, including Google’s largest engineering office in Canada. The proposed East Harbour Transit hub would provide a public transit connection for this corridor — supported by the extended waterfront light rail — enabling new opportunities to attract talent in both locations and reinforcing the region’s global leadership.

In the same way that Toronto’s MaRS Discovery District has created an economic incubator centred on medical research and advances, the proposed innovation campus can support businesses focused on advancing ideas, technologies, and products related to solving urban issues and to improving quality of life in cities.

Accelerating development through strategies like extending the light rail or securing an economic anchor tenant like Google could provide tremendous value to the city, as these impacts magnify exponentially over time. Sidewalk Labs estimates that this approach to the eastern waterfront could triple the number of jobs and housing currently projected by the city over the next 30 years. By 2040, the revitalized eastern waterfront could be generating as much as \$4.3 billion in annual tax revenues — more than seven times the city’s baseline estimates over the same time period.²²

Innovation campus: Active in all seasons

A view of the western edge of the innovation campus (looking west towards downtown).



Stitching this jobs hub into the community

Sidewalk Labs’ proposed innovation campus includes four newly created city blocks on the west side of Villiers Island, straddling New Cherry Street, and could total up to 1.6 million square feet of flexible commercial space. Each of the four sites includes the potential for buildings with very large floor plates (ranging from 30,000 to 90,000 square feet) to accommodate the types of open workspaces preferred by innovation economy companies.

The campus would feature a new pedestrian bridge connection to Quayside and have access to the rest of the city through the light rail extension, which would include a new centrally located station.

A key feature of the approved precinct plan is an east-west spine down the middle of Villiers Island called Centre Street, which forms the main connection between the residential community on the east side of the island and the new parks on the west side of Villiers, including Promontory Park, with its spectacular views of the harbour and downtown.

Centre Street would culminate in Promontory Plaza, a flexible space that transitions from mixed-use buildings to the park, supporting diverse programming that spills out from public ground floors. This flexible stoa space would host retail, production, arts, and community uses, with public passageways and interior arcades providing additional ways to move through the site.

The buildings themselves would embrace Sidewalk Labs’ adaptable Loft typology, which provides large floor plates for highly flexible uses.²³ The height, bulk, and design features of the buildings would be planned in consultation with Waterfront Toronto and the city to ensure that the innovation campus fits in with the scale of the rest of Villiers Island, which Sidewalk Labs would not be responsible for developing.

Planning Villiers West for access, connection, responsibility, movement, and adaptability.

Creating a truly mixed-use community can provide significant benefits for residents and businesses: saving time and money, and improving health, by enabling people to walk or bike to work; supporting vibrant retail and cultural experiences; providing public spaces that are activated year-round; and establishing a unique community character with a diversity of uses and voices.

Along with these benefits, there are challenges as well. Too often, commercial centres turn inward, encourage too much parking, or block vital pathways or views within a community. Avoiding these pitfalls requires creating foundational principles for good planning and making sure those principles are applied to the design of the commercial buildings.



Creating a connected innovation campus

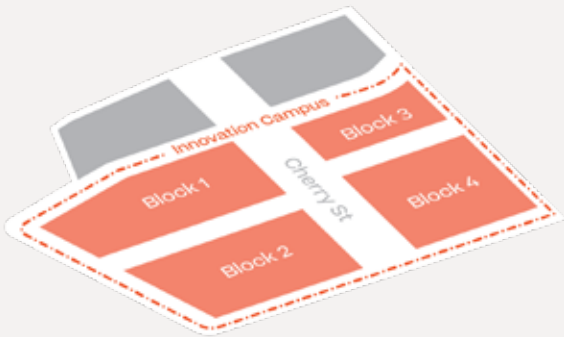
This jobs hub on Villiers West would become a true live-work neighbourhood through a set of features that include a new street network and a light rail connection that provide access to the surrounding city, an extensive park system, and mixed-use blocks.

New public spaces:

- A** Pedestrian bridge to Quayside
- B** Promontory Park
- C** Canoe Cove

New streets:

- D** Trinity Boulevard
- E** Cherry Street
- F** Centre Street
- G** Commissioners Street



In considering the location for the proposed innovation campus, along the blocks on both sides of New Cherry Street, Sidewalk Labs focused on developing a design proposal based on its core planning principles: access, connection, responsibility, movement, and adaptability.

Access.

Providing multiple modes of access is vital to any commercial centre. The campus’s location along New Cherry Street, a broad new boulevard, would allow easy access to the site by light rail, bicycles, and vehicles. Its wide, accessible sidewalks would connect with pedestrian walkways throughout Villiers Island, with footpaths through the adjacent public park, and with the new pedestrian bridges proposed by Sidewalk Labs that would connect Villiers back to Quayside and Keating West.

Connection.

The campus, located between Promontory Park and the residential sections of the island, should not interrupt the natural flow of a neighbourhood. Instead, it must act as a public connection point that knits the edges of the island together. By integrating the campus into the street network, with connections to the rest of the city running to and through the site, this hub can become a vital part of the community rather than a closed campus.

The most important connection is through the centre of the site, where Sidewalk Labs is proposing a wide, public walkway lined with commercial activity to the west of New Cherry Street, linking the residential community to the east with the public parks to the west.

In addition, New Cherry Street runs north–south through the site, ensuring easy connections through the technology campus from all directions.

Responsibility.

Sitting on a site adjacent to a major new park, the innovation campus has a responsibility to respect and enhance the public realm. The proposed plan would present low-scale massing along the edge of Promontory Park and significant features, such as seating areas and performance spaces, along the perimeter of the buildings to extend the public realm. The proposed plan also includes an opportunity to locate a public facility, such as a museum, at the base of one of the buildings, with easy access to the surrounding transportation network and parks.

Movement.

With high levels of access, broad and attractive connections through and around the site, strong retail and public programming at the lower levels of the buildings, and strategically located gathering places along the perimeter, the innovation campus would become a place of constant movement, with workers and visitors engaging with the site in different ways each day.

Adaptability.

The innovation campus is not conceived as a complex to house a single business. Although Google’s Canadian headquarters and the Urban Innovation Institute would be vital anchors, the campus is sized not only to allow for the growth of these anchor tenants over time but to accommodate many other businesses that may choose to locate there.

Sidewalk Labs anticipates that, combined, the Google headquarters and Urban Innovation Institute would occupy less than 50 percent of the commercial space within the campus. Planning for this extra space, and employing Sidewalk Labs’ building strategies for adaptable interior spaces, would permit these buildings to respond over time to accommodate the needs of current and future tenants.

The innovation campus would become a place of constant movement, with workers and visitors engaging with the site in different ways each day.

Beyond Villiers West: A Different Role for Sidewalk Labs

As explained on Page 260, in Quayside and Villiers West, Sidewalk Labs proposes to be the real estate developer in concert with local development partners, to prove out the market viability of innovations and to catalyze an economic engine. For the remainder of the River District, however, Sidewalk Labs proposes to take on a very different supportive role as Innovation and Funding Partner.

Starting in Villiers East, and extending to Keating, McCleary, and Polson Quay, Sidewalk Labs would focus on accelerating development and supporting public policy goals in the River District by serving as an

advisor on planning, design, and implementation; deploying a limited set of core technologies necessary to achieve key project objectives; and providing optional infrastructure financing support.

This role reflects Sidewalk Labs’ belief that the greatest cities are built from the community up and that its proposed innovation strategies for achieving public policy goals can only be successful if widely adopted by Toronto’s broader development and innovation communities.

Key Term
Public administrator

Sidewalk Labs proposes that government designate a public entity to serve — or in the case of Waterfront Toronto, continue to serve — as revitalization lead for the IDEA District.

In this role, Sidewalk Labs proposes to work closely with Waterfront Toronto and government partners on three areas of focus:

1

Planning, design, and implementation.
In this role, Sidewalk Labs proposes to help provide cutting-edge infrastructure and support development that meets agreed-upon guidelines and standards for innovation, with the goal of realizing key quality-of-life objectives around economic opportunity, affordability, mobility, and sustainability.

Building on the Quayside innovations, Sidewalk Labs proposes to prepare a set of “Innovation Design Standards and Guidelines” (IDSG) that can be used to ensure that all developments in the River District achieve the desired outcomes. The IDEA District’s public administrator would be responsible for overseeing the IDSG and ensuring their implementation as development proceeds.

2

Technology support.
In this role, Sidewalk Labs proposes to deploy a limited set of technologies required to achieve key project objectives — defined in Waterfront Toronto’s original RFP as “purposeful solutions” — including a dynamic curb that can adjust throughout the day to accommodate vehicle traffic or pedestrian uses, and a standardized mount system that can help catalyze digital innovation by third parties.

3

Infrastructure financing.
In this role, Sidewalk Labs proposes to provide optional support financing critical infrastructure, such as upfront debt service, to help ensure that the city and waterfront can invest holistically in systems that unlock the potential for future development.

See Volume 3 for more details on Sidewalk Labs’ proposed role as Innovation and Funding partner.

Vision for Villiers East: Achieving Key Public Policy Goals

Villiers East could become a demonstration ground for the roles that Sidewalk Labs proposes to play across the larger IDEA District, which includes helping to plan, design, and implement new infrastructure systems; applying a set of innovation guidelines to improve quality of life, and supporting planning efforts with a new digital tool.



Key facts:

Villiers East

Development timeline
2025–2029

Size
11.6 hectares

Total area
Roughly 4.15 million square feet

Next to the innovation campus described above sits Villiers East, an 11.6-hectare area surrounded by new parks on the east and south and bordered by the Keating Channel on the north.

While the River District can be defined by its progressive mix of uses, the precinct plan calls for Villiers East to feature a

higher concentration of residential development to support the economic development on the western side of the island. These buildings would be constructed by an array of third-party developers, with Sidewalk Labs supporting development as Innovation and Funding partner.



Helping to plan, design, and implement new infrastructure systems

Before development can begin, a comprehensive set of infrastructure systems must be established to support the thousands of new residents, workers, and visitors projected for the area. This area is where Sidewalk Labs believes it can help.

Sidewalk Labs would help to plan, design, and implement a set of advanced infrastructure systems in Villiers East — as with other neighbourhoods in the IDEA District — that support Waterfront Toronto’s priority outcomes, including for new mobility options and a climate-positive community.

As Innovation and Funding Partner, Sidewalk Labs would help to develop an “Infrastructure and Transportation Master Plan” that sets the guidelines for the types of systems required and identifies and supports pathways to implementation.

Creating new mobility networks.

As described on Page 254 and in the “Mobility” chapter of Volume 2, Sidewalk Labs intends to support the extension of the public transit system into Villiers and across the eastern waterfront. Once travellers arrive in Villiers, their daily experience would be shaped by the street network.

Sidewalk Labs believes that the mobility strategies outlined in this proposal — such as expanding transportation options

and planning for the future adoption of self-driving vehicles — can be the basis for significant changes to the street grid that create even more opportunities to support a people-first public realm and a new mobility network. Villiers East can serve as a global showcase for integrating self-driving vehicles into the urban environment at a district scale.

While Sidewalk Labs would propose to maintain the precinct plan’s high-volume boulevards and public transportation routes along New Cherry and Commissioners Streets, the interior streets on Villiers Island could be rethought to remove on-street parking, increase space for pedestrians and bicycles, and limit vehicular access to emergency, special access, and self-driving vehicles only.

This approach would have significant impacts on how each street looks and feels. The entire centre of Villiers Island could become a pedestrian zone, while maintaining access by multiple modes of transportation along the perimeter as well as by slow-moving self-driving vehicles within the interior. Centre Street could be configured as a crooked street, designed to block winds in winter and provide a wide pedestrian boulevard-like experience featuring all the signature street features initiated successfully in Quayside. At a size of 19 total hectares,



Map Proposed Villiers East street network

Villiers East could feature a people-first street network designed around Sidewalk Labs’ four proposed street types.

Boulevards are designed primarily to accommodate longer-distance car trips and faster traffic.

Accessways are designed primarily for cyclists, with traffic moving at bike speeds.

Laneways form the foundation of the pedestrian network, with all traffic moving at pedestrian speeds. A subset of Laneways — pedestrian-only **pedways** — would add yet another dimension to the walking network.

A Cherry Street

B Commissioners Street

C Villiers Street

Transitways are designed to prioritize public transportation in designated lanes.

D Old Cherry Street

E Foundry Street

F Munition Street

G Centre Street

H Interior block pedways



See the “Innovation and Funding Partnership Proposal” chapter of Volume 3 for more details on proposed advanced systems.

Villiers Island is a perfect size for a pedestrian-focused community, with no location more than a five- to six-minute walk from the centre of the island.

Supporting advanced infrastructure systems and climate-positive development.

Building a climate-positive neighbourhood requires a wide variety of strategies — from low-energy buildings to digital management tools — but none is more critical than the provision of advanced infrastructure designed to manage the use of energy, natural resources, and waste as efficiently as possible.

At Villiers Island, both west and east, Sidewalk Labs would work with Water-front Toronto to identify and establish specifications and a path to implementation for each infrastructure system.²⁴ Those systems include:

Thermal grid. A district-wide thermal grid would draw on clean energy sources, such as wastewater facilities, to provide heating, cooling, and domestic hot water.

Advanced power grid. An advanced power grid would use solar energy, battery storage, and time-based energy pricing to reduce reliance on the main power grid during periods of peak demand and make an all-electric community affordable.

Smart waste system. To improve recycling and divert landfill waste, a smart disposal chain would feature real-time feedback to improve waste sorting; “pay-as-you-throw” chutes to reduce household and business waste; and an underground pneumatic tube system to

keep these waste streams separated until they reach a collection facility.

Active stormwater management.

A coordinated network of green infrastructure, including street plantings and bio-retention zones, combined with active management using digital technologies, would improve stormwater retention and contribute to a greener public realm.

Freight delivery. A centralized freight system would deliver packages directly to buildings via self-driving delivery dollies, reducing truck trips from local streets.

Ubiquitous connectivity. A fibre-optic system would take advantage of recent advances to deliver secure and reliable connectivity at maximum speeds and affordable costs.

Additional systems. Additional systems could include tie-ins to existing Toronto-wide utilities, such as water and sanitary sewer connections.

Ongoing exploration. In addition to these systems, Sidewalk Labs intends to evaluate alternatives in the hopes of developing a holistic network of advanced infrastructure systems that ensures a high degree of future flexibility, provides access for a wide range of service providers, and allows for easy, inexpensive maintenance and upgrading of systems. Sidewalk Labs is specifically considering models that would encourage service providers of all sizes to access shareable space, with easy access to complementary systems and to users.

Villiers East can
serve as a global
showcase for
integrating self-
driving vehicles
into the urban
environment.

Applying innovation guidelines at Villiers East to transform streets and buildings

Innovation guidelines can be a critical tool to ensure that the River District achieves the development objectives established by Waterfront Toronto and the city. As a wide array of developers assumes responsibility for designing and building projects throughout the district, innovation guidelines would inform issues ranging from street design to sustainability. They would include technical specifications, design intentions and requirements for buildings and public spaces, and program details to shape how future development is coordinated with infrastructure.

These guidelines would be developed collaboratively between Waterfront Toronto, Sidewalk Labs, and the City of Toronto, and would be responsive to new ideas and technologies as they are proven out in Toronto and beyond.

While the details of the innovation guidelines would be developed over time, the initiatives proposed by Sidewalk Labs across the different urban innovation areas could form the framework, producing successful neighbourhoods that have a unique look and feel while striving to improve the quality of life for residents, workers, and visitors.

The following diagrams illustrate how adopting a few specific elements of transportation planning and urban design within the guidelines could have a significant impact on the physical qualities and experience of the Villiers East neighbourhood.



1 Precinct plan (blocks only).

“Villiers Island will contain a fine-grain network of local streets, with a variety of street types, each contributing to a sense of place and character of the island. Local streets will prioritize non-vehicular movement and flow.” — Villiers Island Precinct Plan



2 Creating more intimate, people-first blocks.

Sidewalk Labs believes that expanding mobility options beyond private cars and integrating self-driving vehicles into the urban environment can drastically reduce the need for on-site building parking, allowing for smaller blocks with public courtyards connected by a network of pedestrian walkways.



3 Generating a more dynamic, varied streetscape.

Sidewalk Labs’ proposed flexible low-floor stoa space is designed to enliven streets by fostering a greater variety of experiences. New weather-mitigation tools would activate outdoor spaces for more of the year. At Villiers East, the stoa spaces could be designed around strategically selected streets and new interior courtyards to become centres of community life.



4 Maximizing building views and sunlight.

Sidewalk Labs proposes to make digital design tools available that can help planners and communities evaluate multiple design options to maximize positive outcomes, such as sunlight on streets, open spaces, and views. Sidewalk Labs envisions sustainable timber buildings throughout the neighbourhood, which can be designed and built more quickly than traditional buildings, and provide significant benefits to public and environmental health.

Helping planners and communities improve neighbourhoods using digital tools

When designing a new neighbourhood, planners, architects, and community leaders have always struggled to balance competing objectives. Increased density can generate more jobs, affordable housing, and strengthened neighbourhood vitality — but it can also cause traffic congestion, block sunlight on or constrain public spaces, and result in poor views.

These choices require an ongoing conversation between the public sector and affected communities to establish shared priorities and determine appropriate trade-offs. But while every neighbourhood seeks to maximize benefits and minimize disruption, it can be difficult to assess the full impacts of any given decision. It can also be challenging to make technical planning concepts or guidelines clear and accessible so that communities can weigh in appropriately.

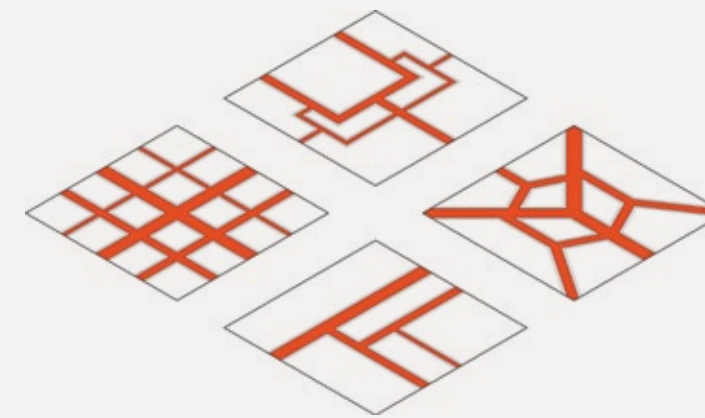
Sidewalk Labs believes that advances in technology and the application of data analytics, computer visualization, and machine learning can empower engineers, architects, planners, community groups, and policy-makers to collaborate more transparently and effectively on building better cities. Sidewalk Labs is developing a digital planning tool called “generative design” that could support this kind of planning effort.²⁵

Generative design is a tool that can help all stakeholders explore and assess design options based on a set of site conditions, constraints, and desired outcomes. It can be programmed to factor in all the components that determine the shape, character, and functioning of a place, such as the width and layout of streets, the shape and orientation of blocks, weather impacts, the height of buildings, and more. Advances in technology have made it cost effective to simulate millions of scenarios to determine which options perform best against a community’s stated goals.

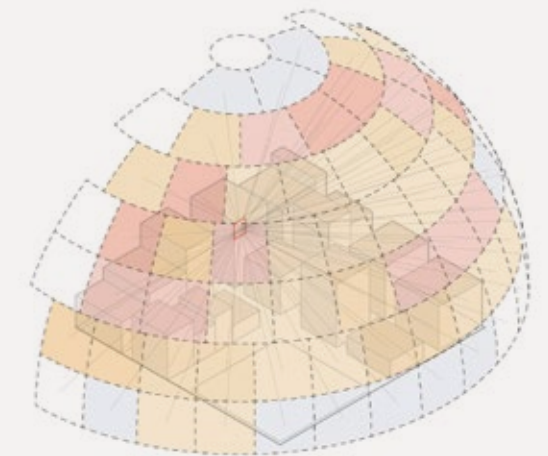
Generative design does not provide answers — on the contrary, it helps people weigh competing objectives and assess potential trade-offs. For example, smaller parks and an irregular street grid can help slow down wind gusts, an important goal in a cold climate like Toronto’s. But people need large parks as well as small ones, and straight streets can be useful. Which design is best? By showing 3D visualizations of the streets and calculating how each decision impacts a range of metrics, the generative design tool can provide reliable information so that these difficult public decisions can be made in an open, transparent, and understandable manner.

Using digital tools to assess thousands of options

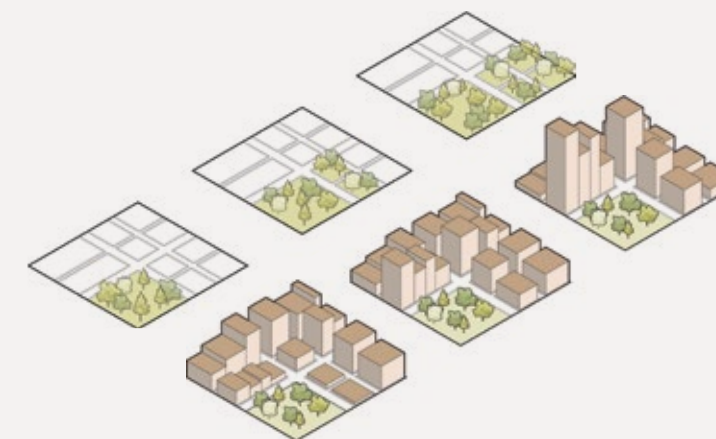
Generative design can help planners and communities evaluate a range factors individually and as part of an integrated plan, including those shown here.



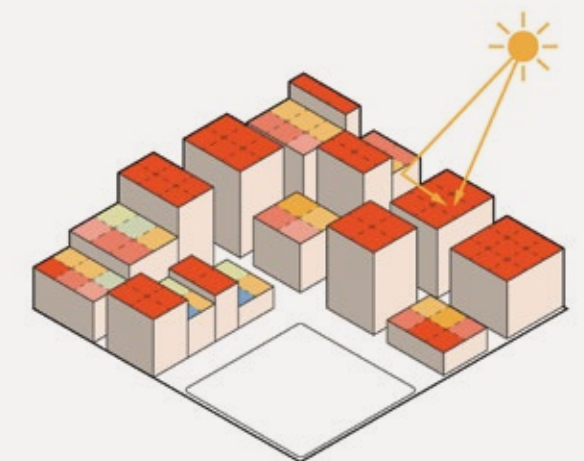
Potential street grids can be explored to help achieve goals such as building access or provision of open space.



Amount of daylight access on streets or open spaces can be explored to help ensure that buildings do not block public spaces from the sun.



Distribution of open space can be explored to balance goals around density and per capita access to green space.



Solar energy yields created by different building orientations can be explored to help communities pursue sustainability goals, such as the ability to generate clean energy on site.

This focus on information and outcomes could open up new possibilities within the regulatory framework to create a performance-based system built around specific targets that are often difficult to achieve through traditional zoning.

In its role as Innovation and Funding Partner (see Page 314), Sidewalk Labs would make these resources available to Toronto planners and the City of Toronto to help create an evaluation framework that could assist in the application of the Innovative Design Standards and Guidelines within the River District. This framework could help ensure that the wide variety of developers, architects, and designers who will be responsible for building out the River District over time will maintain flexibility and creativity in developing new ideas while at the same time ensuring that their proposals achieve key public interest objectives for the River District.

Case study: Applying generative design to Villiers East.

In Villiers East, the existing City of Toronto precinct plan calls for dense housing to support the economic development on the island’s western half. That goal requires finding a balance between the desired density of development while ensuring extensive, high-quality open space to support residents, visitors, and workers.

As planning proceeds in Villiers, the generative design tool can help planners evaluate the performance of different options by running thousands of simulations that weigh factors like building massing, access to natural light, and wind.

One strategy proposed by Sidewalk Labs to achieve these goals involves breaking down the development blocks into a series of small buildings with pedestrian courtyards, creating more intimate environments for residents to mingle. As a test, Sidewalk Labs used its generative design tool to conduct a preliminary study of possible courtyard configurations for a two-by-two block area of Villiers, aiming to optimize for three variables: percentage of open space, sunlight access in the courtyard, and density (gross floor area).

In an initial run, the tool generated and analyzed thousands of permutations and surfaced roughly 400 plans that created more open space and allowed more sunlight to reach the streets than the precinct plan baselines — while also adding more density (see visuals).

Generative design can also evaluate district-wide impacts, giving communities the information to take a more active role in shaping their environment. In the end, if generative design does its job, neighbourhoods would work and feel better, because they would more fully achieve the values and priorities of the city.

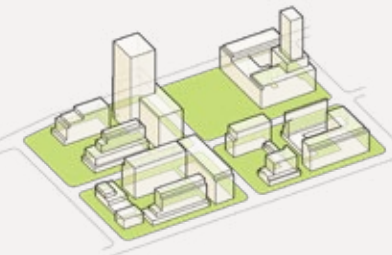
Generative design case study: Villiers East

A generative design analysis of a two-by-two block in Villiers Island produced roughly 400 plans (out of thousands of permutations) that created more open space, daylight access, and density than the existing precinct plan.



Precinct plan

Open space	45.3%
Daylight access	49%
Total GFA	1,513,144 ft²



Generative design #00530

Open space	5.2% increase
Daylight access	13.6% increase
Total GFA	+24,243 ft²

This run was created through making marginal changes to the precinct plan; it has small increases in open space and density, and a large increase in daylight access.



Generative design #00469

Open space	3.31% increase
Daylight access	20.61% increase
Total GFA	+196,710 ft²

This run was created through making moderate changes to the precinct plan; it has a small increase in open space, a medium increase in density, and a large increase in daylight access.



Generative design #01140

Open space	12.6% increase
Daylight access	8.6% increase
Total GFA	+496,781 ft²

This run was created through making significant changes to the precinct plan; it has a medium increase in daylight access, and a large increase in open space and density.

Vision for Keating Channel: Reclaiming a Historic Canal

This historic channel could stitch together the waterfront to create a new kind of urban environment that blends innovative economic development, art, culture, restaurants, retail, and production.



Key facts:
Keating East

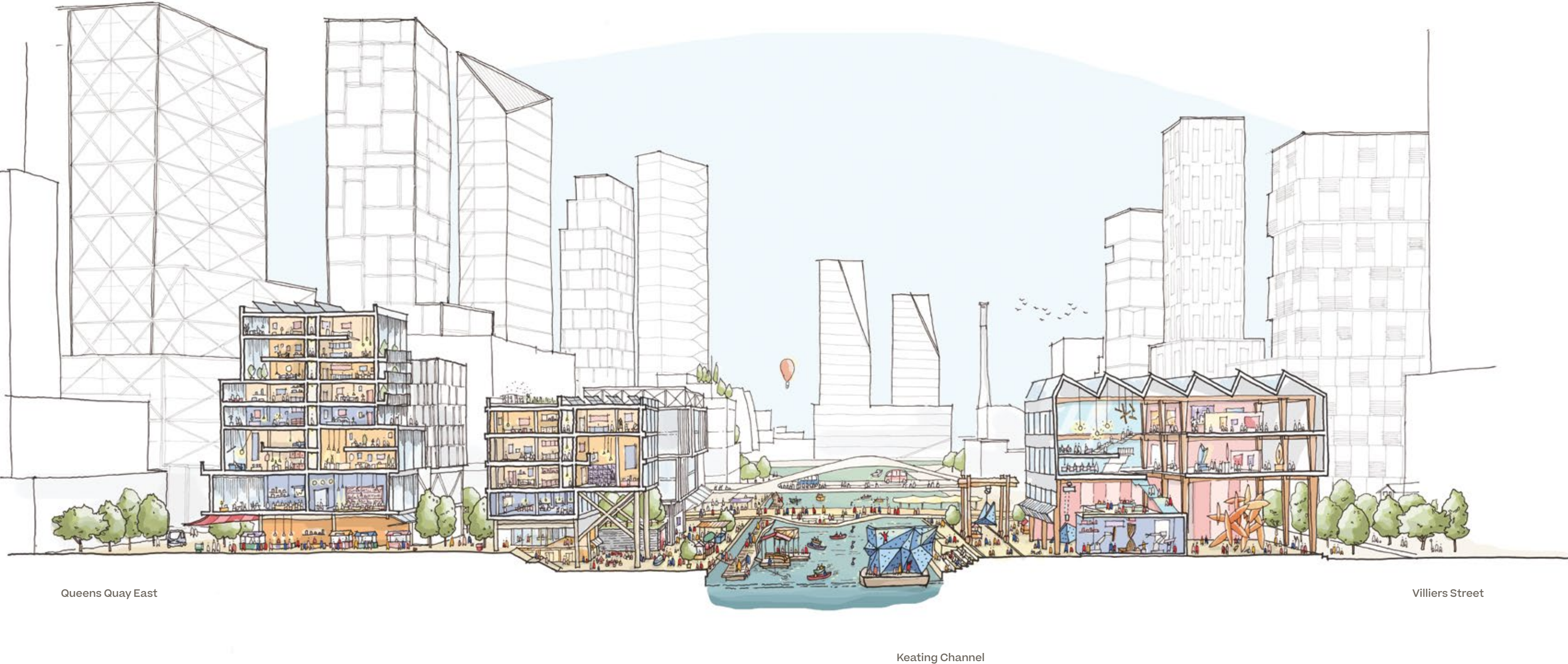
Development timeline
2029–2033

Size
5.9 hectares

Total area
Roughly 3.45 million square feet

As home to the new Google Canadian headquarters, Villiers Island is envisioned as a major economic engine for the western Port Lands, but the economic development opportunities would not be limited to the innovation campus. Villiers Island’s unusual geography and the historic buildings and structures remaining from its industrial and maritime history provide the framework for an additional, entirely different, economic driver.

Great cities around the world, like Rotterdam in the Netherlands and Nantes in France, have reclaimed post-industrial waterfront sites to build new neighbourhoods centred around art, creativity, production, and the creation of an experimental culture that attracts residents and visitors from the local region and beyond. These successful developments share a common approach: they capitalize on the physical features of their sites and draw on the culture of their cities to invent new approaches to urban living.



With the renaturalization of the Don River, the Keating Channel — built in 1915 as the hard-edged connection between the river and Lake Ontario²⁶ — can be reclaimed as an urban canal, forming the unifying feature of a new neighbourhood dedicated to creativity and innovation.

Developing both sides of the channel.

Transforming this historic waterway will require innovative approaches to infrastructure and mobility, public space, buildings, and development. The key to success will be ensuring that both sides of the channel create a unified centrepiece that links Villiers Island with the Keating neighbourhood, as envisioned in the Port Lands Planning Framework.

On Villiers Island, the historic structures scattered along the channel’s edge create an opportunity for non-traditional uses. They could be reclaimed for small-scale arts and fabrication, while a large open plaza could be home to Sidewalk Labs’ adaptable stoa concept, hosting a wide range of cultural and public programs. Across the channel, Keating could host small-scale workshops and artist studios, stores, kiosks, and restaurants.

Low-scale buildings on both sides of the channel could provide an intimate setting along the waterfront, which could be connected by new pedestrian and bicycle bridges and a continuous promenade along the water’s edge. The public realm could extend onto the water itself, which could host a series of floating barges for cafés, art installations, and recreational activities.

This new exploration zone could host an ever-changing series of events and installations and could capture the spirit of a district built around innovation. As Villiers Island develops over time, the early activation of the Keating Channel zone with temporary uses and special programming to draw people to the site could help to establish the area as a place where new ideas are welcomed and celebrated.

Keating: A vibrant new community connected to Villiers Island.

Keating is currently isolated on all sides by the Gardiner Expressway, a railway yard, and railway tracks. In November 2017, the Province of Ontario approved the City of Toronto’s plans to relocate the parts of the Gardiner and Lake Shore Boulevard that currently run along the Keating Channel and move them adjacent to the train infrastructure on the neighbourhood’s northern edge. That would still leave one side of the neighbourhood inaccessible to the surrounding city but would create possibilities for a new community that embraces the Keating Channel and connects to the Distillery District to the north.

A thoughtful use of scale could minimize the lack of connection to the northern edge and reorient development towards the water. Dense residential towers along the highway could scale down to an intimate presence at Keating Channel, providing easy access to the culture, retail, and community spaces lining both sides of the waterfront.

A new arts and production exploration zone along Keating Channel could capture the spirit of a district built around innovation.

Vision for McCleary: Creating a Model Live- Work Neighbourhood

Nestled between the projected 8 million square feet of commercial development at East Harbour, Toronto’s burgeoning Film District, and the urban innovation hub at Villiers, McCleary could bring thousands of jobs within a short distance of its new residents.



Key facts:
McCleary

Development timeline
2028–2032

Size
13.6 hectares

Total area
Roughly 6.7 million square feet

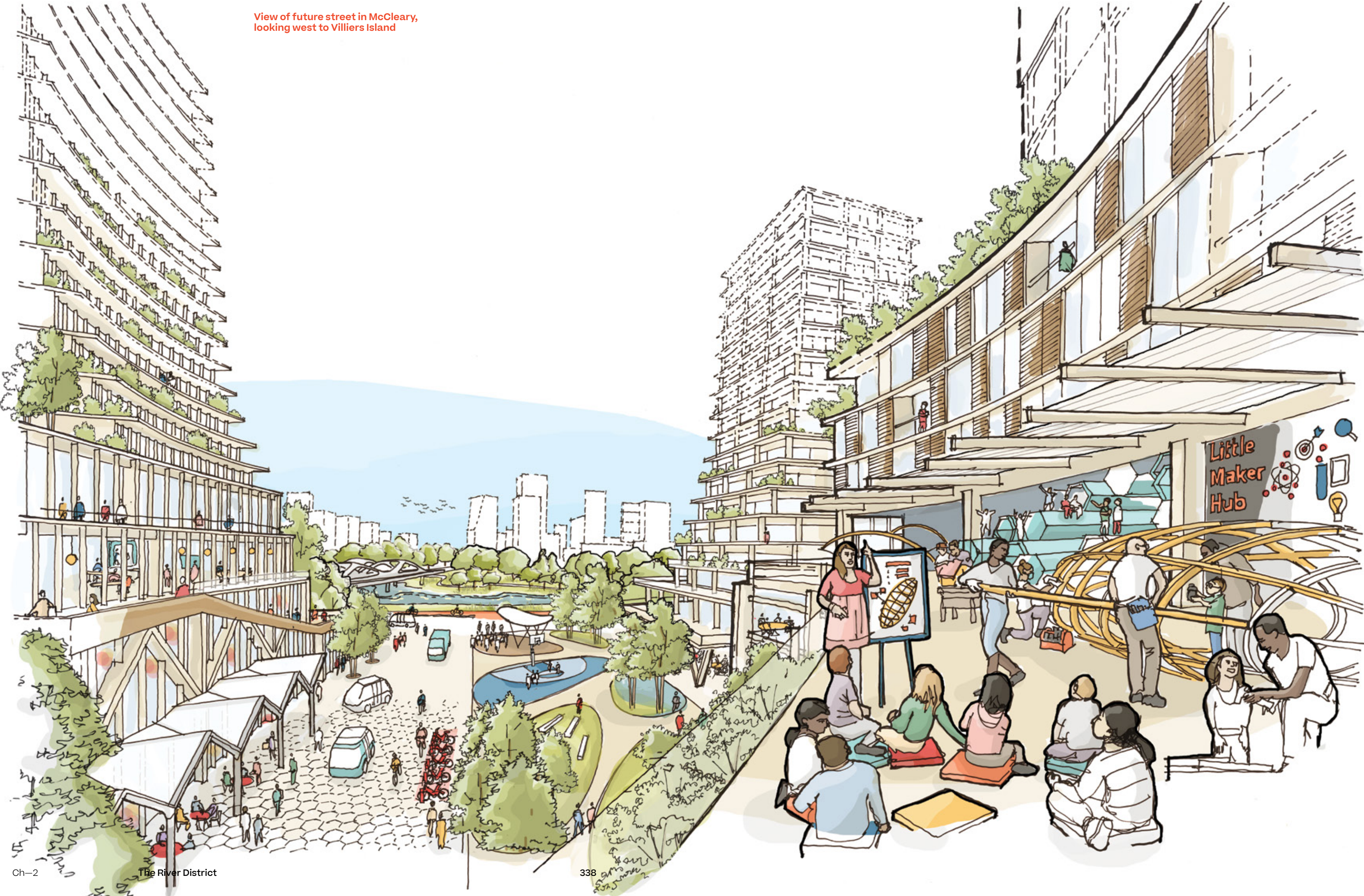
McCleary could become a critical link within the developing eastern waterfront given its proximity to three major job centres, the new planned GO Transit station and Ontario Line,²⁷ and new public destinations like the park network surrounding the Don River.

This central location makes McCleary uniquely capable of supporting the planned East Harbour commercial district to the north, the expanding Film District to the south, and the innovation

campus at Villiers Island to the west through a dense, mixed-use development plan that could include housing for potential workers, along with commercial and production spaces that could complement the work at each economic hub.

With its mix of housing, new jobs, and striking public spaces, McCleary could embody the model for a sustainable community, supplying a labour force of thousands of residents who can walk or

View of future street in McCleary, looking west to Villiers Island



McCleary could
feature up to
7,000
housing units.

bike to jobs within minutes and creating a healthier lifestyle that minimizes commute times and costs, as well as the need for on-site parking.

Expanding affordable options for the local labour force.

Dense residential development, which could include up to 7,000 units, would enable McCleary to offer prospective residents a broad variety of housing types and ownership models, creating an inclusive and diverse community.

The tallest buildings and greatest numbers of residents could be concentrated along the neighbourhood’s northern edge, adjacent to the 8 million-square-foot East Harbour development. As the neighbourhood approaches the waterfront, the buildings could scale down to integrate into the mixed-use waterfront community.

An expansive, animated public realm network could connect the Don River at the western edge of the neighbourhood to the expanded McCleary Park at the eastern edge. The Port Lands Planning Framework calls for the park to be reconfigured and expanded to support further recreational activities and to seamlessly integrate with the revitalized Commissioners Incinerator building, which could serve as a district-wide community centre.

Complementing surrounding areas with a unique mix of spaces.

Consistent with the Port Lands Planning Framework’s identification of the area as a Production, Interactive, and Creative (PIC) mixed-use area, McCleary would also host a mix of commercial spaces that complement — rather than compete with — the adjacent developments, particularly the film district.

That could include businesses such as production facilities, light industry space for set or costume design, or offices for technical arts like sound engineering. In fostering film-supportive housing and businesses, Sidewalk Labs believes McCleary can serve a significant role in supporting the ongoing expansion of the film industry.

Supporting the precinct planning process.

The final vision for McCleary requires a comprehensive precinct planning process. Under Sidewalk Labs’ proposal, this effort would be conducted as a joint exercise completed by Waterfront Toronto and the City of Toronto, with Sidewalk Labs in the role of innovation partner. A range of private developers, engaging their own architects and designers, would then be selected by the appropriate public agency to construct the actual buildings.

With its mix of housing, new jobs, and striking public spaces, McCleary could become a critical link to support three major surrounding job centres.

Vision for Polson Quay: Reinventing a Working Waterfront Neighbourhood

Polson Quay could capitalize on its unique economic and recreational potential by creating a waterfront community that integrates housing, creative production and commercial space, and a spectacular public realm network that spans land and water.



Key facts:
Polson Quay

Development timeline
2030–2034

Size
23 hectares

Total area
Roughly 9.75 million square feet

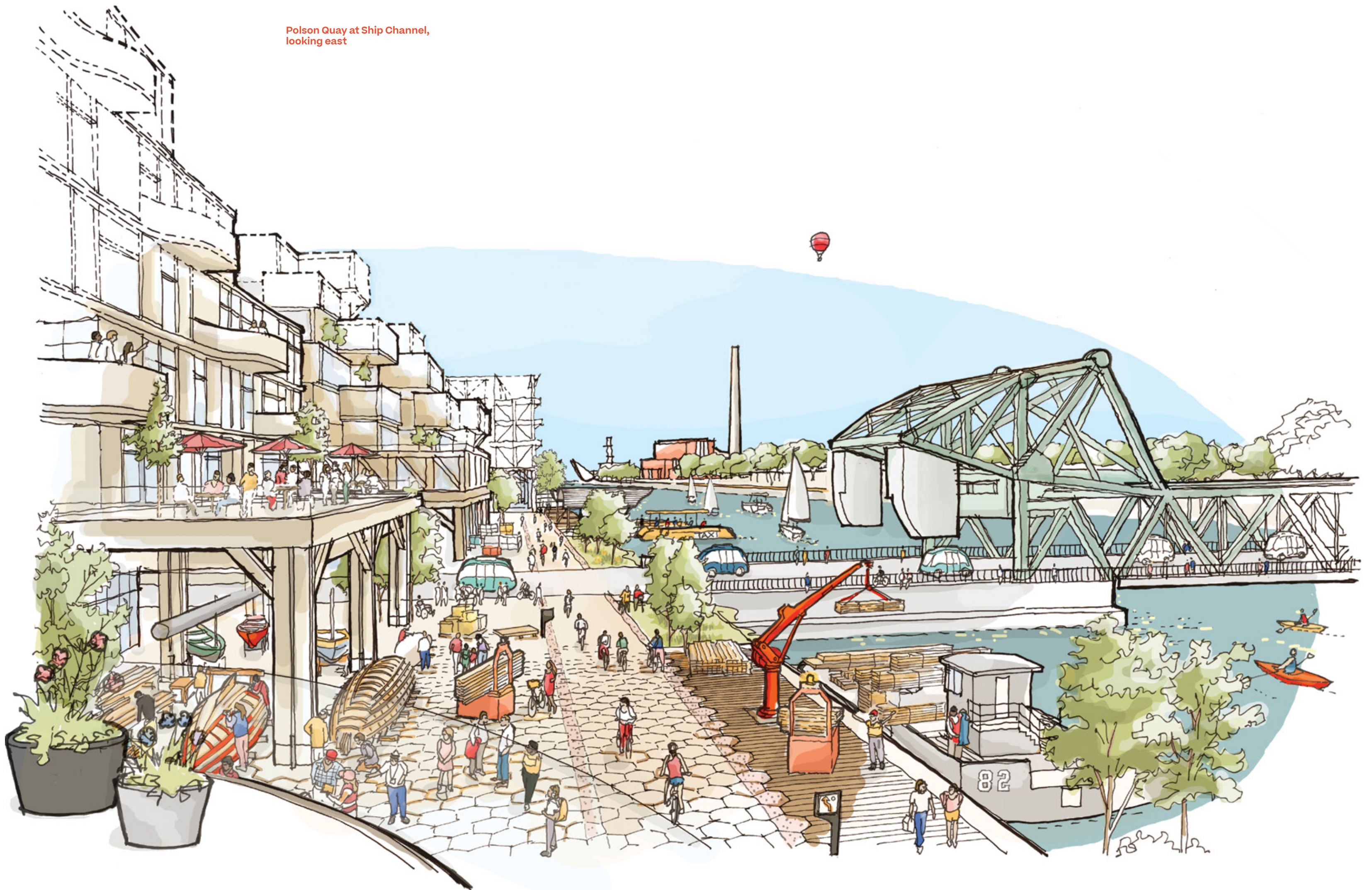
The final piece of the River District to be developed would be Polson Quay, a 23-hectare peninsula surrounded on all sides by water or wetlands — and the only neighbourhood in the eastern waterfront with buildings directly bordering the harbour.

This area includes the Polson Quay and South River precincts identified in the Port Lands Planning Framework. Treating them as a unified neighbourhood would recognize the shared opportunity across

both sites to develop a comprehensive plan to spur economic growth while enlivening the area through a vast new network of parks and public space, ample housing, artisan workshops and production spaces, and unusually intimate waterfront access.

This development can support the inspiring work of the artists, designers, and other makers who inhabit the historic Dominion Box Boards to forge a creative enclave.²⁸ This heritage structure can

Polson Quay at Ship Channel,
looking east



become the heart of a fully revitalized neighbourhood, with the existing tenants continuing to play a major role in the community.

The density and diversity of programming at Polson Quay would be supported by an extension of the light rail, with a new stop planned for the neighbourhood’s centre.

Reinventing the working waterfront as a modern mixed-use community.

With its unique waterfront setting — encompassing an active shipping channel, the harbour, and the renaturalized Don River — Polson Quay has an opportunity to reimagine the city’s relationship to water.

As the only neighbourhood in the River District with buildings along the inner harbour, Polson Quay could enable maritime uses that coexist with a spectacular new public realm created by the flood protection plan. That project will create an urban esplanade that curves around Polson Quay and connects to a new central park that stretches between the edges of Villiers and Polson Quay, with pedestrian trails winding through the wetlands.

Sidewalk Labs proposes an additional pedestrian bridge at the western edge of Polson Quay, which would connect this area with the technology campus and showcase exceptional views of downtown, Lake Ontario, and the Toronto Islands, enabling people to walk one continuous path from Quayside to the stunning new parks on Villiers Island and Polson Point.

On its southern side, Polson Quay borders the Ship Channel. Boats could become part of the neighbourhood’s daily life as sources of transport, recreation, and shipping to support light industry.

Polson Quay could modernize the concept of a working waterfront, with workshops for active and adaptable light industry and production spaces integrated into the streetscape alongside housing, parks, and shops. These workshops could become a foundational part of the neighbourhood’s identity.

A range of housing options, including new live-work spaces and affordable rentals, could be designed to meet the diverse needs of people working in production, industrial, or port uses across the Port Lands.

Supporting the precinct planning process.

Similar to McCleary, Polson Quay will require the creation of a precinct plan to guide its development. This planning process would need to grapple with some of the unique constraints of the site as identified by the Port Lands Planning Framework, including the Cement Terminal and nearby port and industrial uses, which could pose substantial issues to Toronto’s vision for integrating housing alongside industry.

As innovation partner, Sidewalk Labs can provide new technologies to help city planners assess which of these uses are compatible and which should



See the “Buildings and Housing” chapter of Volume 2 for more details on the proposed outcome-based code system.

be relocated to preserve the mixed-use community. Once the neighbourhood is developed, digital tools could help support an ongoing evaluation to ensure that the mix of uses is successful. For example, the proposed outcome-based building code system can provide real-time monitoring and management of environmental concerns, such as noise, odour, and vibrations.

For industrial uses that are deemed incompatible with the mixed-use community, Sidewalk Labs can help craft a transition strategy to explore their relocation.

As with the rest of the River District, Polson Quay’s range of private developers would all be required to meet the district’s Innovative Design Guidelines and Standards to ensure that the neighbourhood meets world-leading standards for sustainability, affordability, and advanced systems and becomes a fitting culmination to an extraordinary district.

Polson Quay could modernize the concept of a working waterfront, with workshops and production spaces integrated into the streetscape alongside housing, parks, and shops.

Scaling Urban Inno- vations

The following section describes how innovations initiated in Quayside can scale across the River District. As described more in Volume 3, Quayside becomes possible only when considered in combination with the River District.

Such scale is necessary for many of the innovations to become financially viable and to maximize their ability to help achieve Waterfront Toronto's core outcomes around job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).

Mobility



Accelerating mass transit extensions across the eastern waterfront

The River District’s scale makes it possible to realize a long-planned light rail extension across the eastern waterfront through a self-financing mechanism, accelerating transit-centred development that would create more affordable, convenient, and sustainable neighbourhoods.

Toronto’s leaders have long understood that planning for public transportation in tandem with the initial development of the eastern waterfront is essential to the area’s success. Without that service, travel options to the area would be limited and the vision for the Port Lands as a significant economic driver for Toronto’s future would be impossible to realize. Development would become overly reliant on road infrastructure, in contrast to city and waterfront objectives around sustainable mobility.

There is also widespread agreement about the path forward: the city’s 6.5-kilometre light rail extension across the eastern waterfront that would provide dramatic benefits, such as reducing traffic and greenhouse gas emissions, attracting commercial tenants, opening up the

neighbourhoods to a broader range of residents, and accelerating development. The city’s proposed extension would even improve transit service and travel times, with smarter spacing between stops, signal prioritization, and dedicated transit lanes.

Ultimately, this plan could become the foundation for a reconceived mobility network that prioritizes pedestrians, bicycles, and transit, providing exciting possibilities for neighbourhoods that are safer, more affordable, sustainable, and convenient.

But more than a decade after planning began, the light rail plan, which could cost approximately \$1.2 billion, remains unfunded — with no clear path to implementation.²⁹



See the “Mobility” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Mobility” section.

The River District is ideal for self-financing. Sidewalk Labs believes that a proven financing mechanism of self-financing, sometimes referred to as “value capture,” could finally make this project a reality if governments should not be willing or able to fund from more traditional sources. In this approach, the light rail would essentially fund its own extension, using the projected revenue streams from the future development — made possible by the new transit lines — to finance the upfront construction costs.

Such an approach has been used in Canada before, in Calgary and Winnipeg,³⁰ and has been proposed to offset the cost of Toronto’s SmartTrack plan to electrify and add new stations to Toronto’s surface-rail network. When applied to the eastern waterfront, it would allow construction of the light rail to proceed as development begins, while limiting the amount of direct public funding required.

This self-financing strategy is only viable for certain projects.³¹ The key issue is whether the transit expansion will create enough value to offset the cost of building that expansion. The strategy is often not viable where new transit will serve existing neighbourhoods, because those areas are already sufficiently valuable, meaning that new transit services do not add much. Likewise, a low-density development might not generate enough revenue to cover the high costs of transit infrastructure.

A small neighbourhood such as Quayside, consisting of just a few blocks, could never repay the massive investment required. But the River District provides the potential for enough new development at high enough density to design and fund a rapid transit system that can nourish new neighbourhoods and support their growth.

The approved extension would include up to 19 new stops across a route that connects Quayside, Villiers Island, McCleary, and Polson Quay with the newly planned East Harbour station and the rest of the city.

The LRT extension can unlock massive economic opportunity. In addition to becoming financially feasible at scale, the sweep of the proposed transit extension also delivers greater benefits: adding multiple lines crossing the eastern waterfront delivers access and service to riders that a one-or-two-stop extension does not.

An economic impact report prepared by the engineering and development consultancy Hatch for the Waterfront Business Improvement Area showed that construction of the light rail through Quayside and the River District would generate land value of \$4.5 billion between 2025 and 2045 and \$22.8 billion in additional tax revenue to the governments of Toronto, Ontario, and Canada over the 20 years following completion of the project.³²



Map

Proposed light rail network in the River District

Sidewalk Labs proposes to accelerate the completion of the city’s planned light rail extension, with an additional optional segment through Keating Channel. This would unlock new development and create essential connections to the rest of the city.

- IDEA District
- Existing and planned rapid transit lines
- Approved light rail extension
- - -○- - - Optional light rail extension
- 5-minute walk from new light rail stops
- Planned East Harbour station



See the “Innovation and Funding Partner Proposal” chapter of Volume 3 for more details on optional financing support for the light rail extension.

Beyond the approved plan, Sidewalk Labs further proposes an optional second phase of construction to add light rail infrastructure to the area north of the Keating Channel to serve future development.

By 2041, these extensions could serve roughly 72,900 Torontonians and would have a significant economic impact.³³

Given the project’s fundamental importance, Sidewalk Labs is prepared to provide certain assistance with the financing for the approved plan.

Strengthening public transit across the eastern waterfront unlocks virtually every goal held by Toronto for its waterfront. Street space can be reclaimed to create a larger, more vibrant public realm that anchors new communities.

Reducing the expenses associated with car ownership supports more affordable lifestyles,³⁴ making the eastern waterfront accessible to more people. Relying more heavily on public transit dramatically reduces greenhouse gas emissions,³⁵ forming a critical step in the path to a climate-positive community.

Relying more heavily on public transit dramatically reduces greenhouse gas emissions, forming a critical step in the path to a climate-positive community.

The River District could support enough density to design and fund a rapid transit system that could spur new, thriving neighbourhoods.

Creating new neighbourhoods with people-first street networks

Planning for the eventual adoption of shared self-driving vehicles has the potential to reshape streets into people-first mobility networks by dramatically reducing parking and increasing space for pedestrians and cyclists.

The way space is allocated within a typical city street rests on a few assumptions. One is that private cars are the primary way people get around and that they therefore deserve the most space. Another is that those cars are driven by people who, often distracted or driving too fast, pose a significant danger to others and therefore should be permanently separated from other modes of transportation.

The result is a city street where cars have wide rights of way that are marked off with curbs. Cyclists and pedestrians have to squeeze into the spaces on the margins while public transit gets stuck in traffic even though its vehicles carry scores of riders instead of just one.

Waterfront Toronto has built streets based on a different set of assumptions. One is that walking, cycling, and public transit are as important as private cars — and often more efficient. Another is that the more high-quality space provided on the street for each of these modes, the more all of them will be used, as shown by the unexpected high volumes of cyclists on the Martin Goodman Trail.³⁶

Sidewalk Labs embraces this vision and proposes to build on this work with an additional assumption: that self-driving vehicles — often called autonomous vehicles — will be both safe and commercially ubiquitous available for rides by roughly 2035, and that smart planning can harness their potential to be better neighbours for pedestrians, cyclists, and



Map Proposed street network in the River District

The proposed street network balances the need for longer trips by vehicles and public transit (on Boulevards and Transitways) with the need for streets that prioritize cyclists, pedestrians, and sidewalk activity (Accessways, Laneways, and the interior pedestrian network).

- IDEA District
- Boulevards
- Transitways
- Accessways
- Laneways
- Pedways
- Open space
- Pedestrian network
- Future neighbourhood street networks to be planned

public transit users. Self-driving vehicles can be programmed to drive more slowly and carefully, as well as to give priority to public transit, bicycles, and pedestrians.

The consequences of these assumptions are profound. By proactively shaping the ways that self-driving vehicles are integrated into city streets and by using a range of policy, pricing, and digital tools to encourage shared rides and prioritize public transit, cities can design streets for people.

This approach enables more space to be reclaimed for the public realm as well as more shared streets, where pedestrians can safely coexist with self-driving vehicles programmed to stay at certain low speeds. (The shared streets concept is already practiced successfully today with traditional cars, especially in Europe.)³⁷ To accommodate increased pedestrian traffic, city blocks can feature more extensive interior pathways and courtyards.

Smart planning can harness the potential of self-driving vehicles to be better neighbours for pedestrians, cyclists, and public transit users.

The ultimate goal is to build more active and engaging streetscapes. More space allows for more trees, public art, street furniture, and other amenities. This change can have a cascading effect. More amenities bring more people to the street, and having more people on the street improves the prospects and usefulness of local retail, which in turn draws more people in a virtuous cycle.³⁸ This approach can take one of the great joys of urban life — strolling down a lively street — and make that experience fundamental to every corner of a neighbourhood.

New street types for a balanced mobility network.

To realize the vision of a complete mobility network, Sidewalk Labs has designed four street types to balance the need to travel quickly and efficiently against the imperatives of pedestrian safety and enhanced street life.³⁹

Since Quayside is only four blocks long and includes three existing streets whose designs must be largely maintained, it is too small to implement these new street types and realize their full benefits. But the River District presents an opportunity to integrate this new people-first transportation network.

Four new street types can balance the need to travel quickly and efficiently with the need for pedestrian safety and enhanced street life.

Boulevard. The Boulevard is the widest street type, with a top speed of 40 kilometres per hour and a maximum width of 31 metres. Designed primarily to accommodate longer-distance trips for all modes, Boulevards would typically be situated along the perimeter of a neighbourhood. To help improve safety for all street users, Boulevards feature separated bikeways for cyclists and sidewalks for pedestrians.

Transitway. Like Boulevards, Transitways have a top speed of 40 kilometres per hour, but they have a maximum width of only 26 metres, with priority given to public transit. The Transitway features hubs for bicycles and scooters and safe, wide crosswalks, providing seamless cycling and walking access to stations.

Accessway. Accessways are narrower streets that serve as a core part of the cyclist network and are intended for traffic moving no faster than cycling speeds. The streets are designed for top speeds of 22 kilometres per hour and a maximum width of 16 metres. Self-driving vehicles are permitted on Accessways if travelling at bike speeds. Accessways do not have separated sidewalks but guide cyclists and pedestrians via lighted pavement or digital signs. Accessways would provide emergency access and servicing to buildings that are not otherwise accessible by Boulevards and Transitways.

Laneway and Pedway. These streets form the foundation of the pedestrian network and are envisioned as the most common type of street in Villiers, Polson Quay and McCleary. The only difference between them is that Laneways would allow vehicles travelling at walking speeds and Pedways would not. Laneways are designed for pedestrian speeds, with a top speed of 8 kilometres per hour and a maximum width of 11 metres. Bikes and self-driving vehicles for people with accessibility needs are permitted on Laneways if travelling at the proper speed.

Pedways are the courtyards located within blocks and walkways between buildings and should be open and inviting to residents and visitors. With no regular vehicular access, they would come in all shapes and sizes depending on the varied properties of a block (but would be sized to accommodate emergency vehicles). Both types are meant to help get people places but also to be places unto themselves: they can be quiet side streets where kids play or they can be filled with pop-up shops, street fairs, and other types of community gatherings. Linked with Pedways, Laneways could stitch together a continuous pedestrian-dominated network where it would be a pleasure to walk.

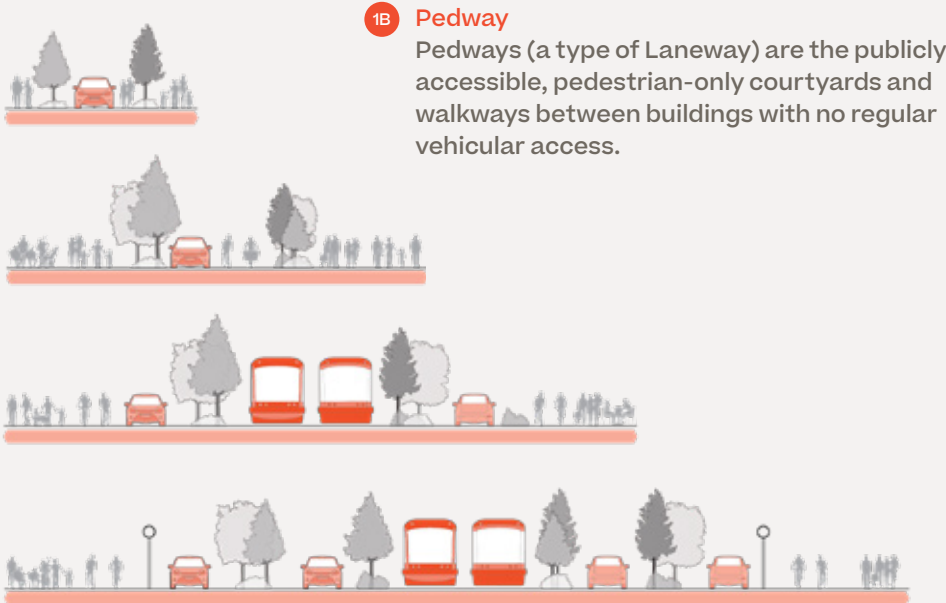


The four proposed street types

Villiers East offers an illustrative street network that incorporates all four proposed street types.

- 1A Laneway**
Width: 11 metres
Priority mode: Pedestrians
Priority speed: 8 km/h
- 2 Accessway**
Width: 16 metres
Priority mode: Cyclists
Priority speed: 22 km/h
- 3 Transitway**
Width: 26 metres
Priority mode: Public transit
Priority speed: 40 km/h
- 4 Boulevard**
Width: 31 metres
Priority mode: All modes
Priority speed: 40 km/h

* Atypical condition



Expanding opportunities for cyclists

To help cyclists reach higher speeds while improving street safety, the River District’s network would feature many separated cycling lanes, including the Martin Goodman Trail.

The district’s primary bike network would run on Boulevards, Transitways, and Accessways, including a newly proposed dedicated lane along the extension of Trinity Street, across a bike bridge over the Keating Channel, and through Villiers Island. Similar to Quayside, River District Boulevards and Transitways would feature separated bike lanes that are five metres wide and are equipped with heated pavement and “green wave” lighting that helps ensure cyclists can move through traffic lights safely and with priority.

On Accessways, bikes would be prioritized with centre-running lanes and share space only with other modes travelling at bike speeds. Accessways could offer a central heated running lane of three to five metres wide.

Outside of these areas, cyclists would be welcome to travel on the streets at the prevailing speed and, notably, at walking speed when in pedestrian areas.

All told, the district would feature extensive new dedicated bike infrastructure. Within the River District, the target would be for cyclists to be able to reach 100 percent of buildings using either a dedicated bike lane or a roadway designed for bikes, compared to roughly 15 percent in a typical downtown Toronto neighbourhood today.⁴⁰

Within the River District, cyclists would be able to reach 100 percent of buildings using streets designed for bikes or dedicated lanes.



Map Proposed bike network in the River District

The proposed bike network builds on the city’s existing network and planned expansions to create new cycling infrastructure that connects onto Villiers Island, including bike bridges.

- | | |
|----------------------|------------------------|
| Primary route | Secondary route |
| | |
| | |
| | |
| | |
| | |
- Existing bike network
 - City planned and proposed expansion of bike network
 - Sidewalk Labs proposed further expansion of bike network
 - Future neighbourhood bike network to be planned
 - IDEA District

A neighbourhood moved by new mobility

The forward-looking mobility systems of the River District would demonstrate the extraordinary quality-of-life benefits that come with designing a transportation system that can adapt to the changing needs and technologies of the 21st century.

The most visible changes in urban mobility in the 21st century so far have been the emergence of ride-hailing, the rise of bike- and scooter-sharing,⁴¹ and the dramatic growth in parcel deliveries driven by online shopping.⁴² These trends have all improved convenience, but except for bike-sharing, they have also harmed the urban environment by increasing traffic congestion, especially as delivery trucks and for-hire vehicles fight for curb space.⁴³

Quayside can test some solutions to these problems, including a mobility package that discounts some shared rides each month, streets designed for self-driving vehicles, and an underground freight delivery system. But a citywide transportation challenge cannot be solved on four blocks alone.

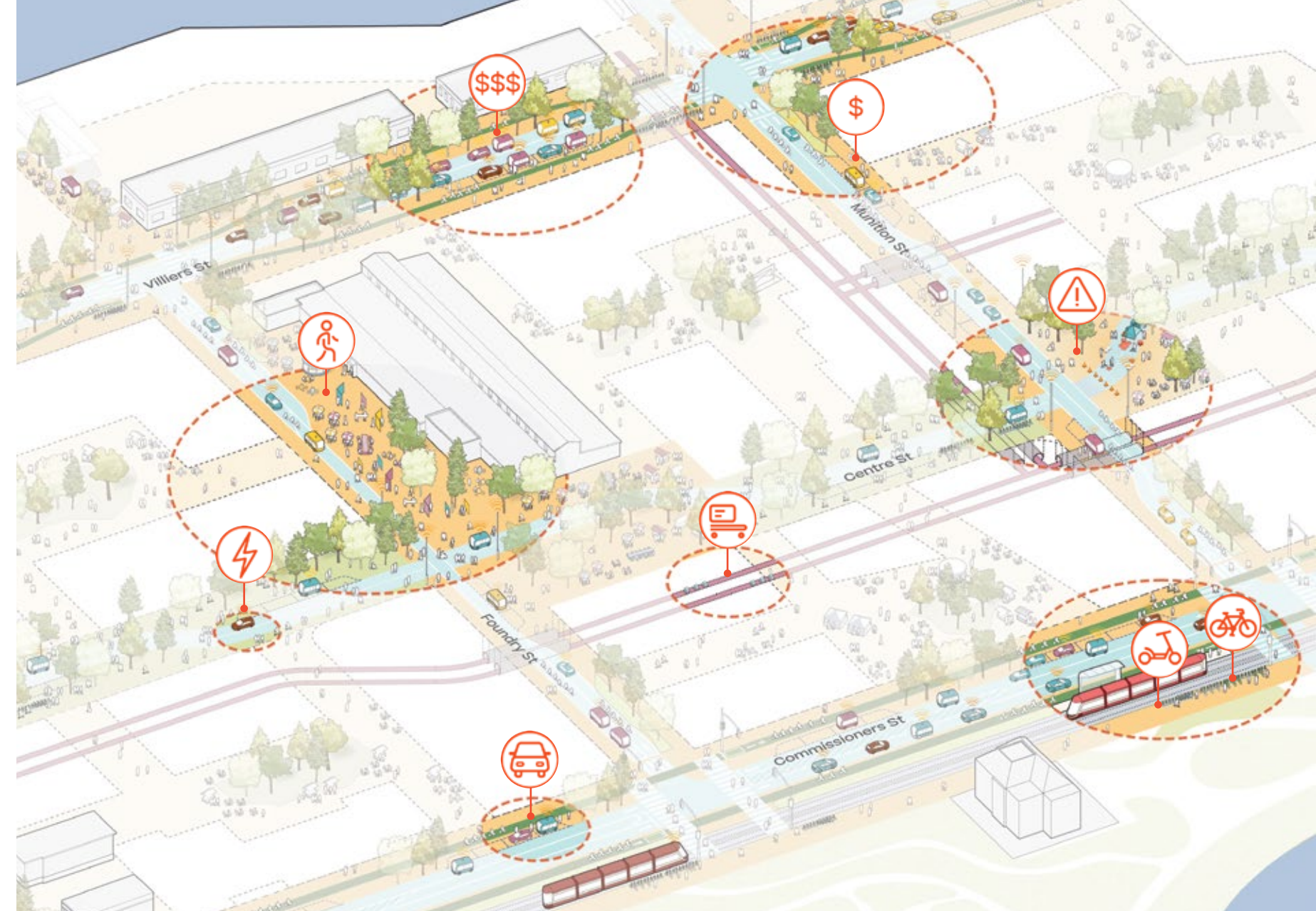
Applying the successful solutions across an entire transportation network can maintain the convenience offered by these new innovations while reducing traffic congestion and its related problems.

The River District has the potential to become a model for 21st-century urban mobility.

Discounted mobility packages.

Sidewalk Labs is committed to providing people with a full set of transportation options designed to meet all of their needs without owning a car. These options include expanding public transit, creating more walkable neighbourhoods and more extensive cycling networks, and increasing the availability of ride-share and ride-hail options.

But it can be hard for people to evaluate all of their choices — and the costs of various options — in real time. That is why Sidewalk Labs is proposing digital tools that can help residents and workers understand the real price of each transportation option, encouraging the choice of public transit via discounts and credits. A monthly mobility subscription that



Map

New mobility systems on Villiers Island



Dynamic curbs provide drop-off and pick-up availability, with pricing based on congestion levels.



Streets restricted to self-driving vehicles reduce vehicle lanes and maximize pedestrian space.



Electric self-driving vehicles create quieter streets and less pollution.



On Boulevards, dynamic curbs provide drop-off and pick-up space for both self-driving and traditional vehicles.



Self-driving delivery dollies operate in below-grade tunnels, reducing truck traffic on streets.



Dynamic streets can adjust space allocations based on real-time traffic conditions, with self-driving vehicles easily routed around street closures.



Multi-modal transportation options, such as bikes and scooters, are located adjacent to light rail stations.

integrates these real-time options could cover a discounted Toronto Transit Commission pass, an unlimited Bike Share Toronto membership, access to e-scooters and other low-speed vehicles, and credits for rides with ride-hail or car-share providers.

At the scale of Quayside, the combination of these strategies can achieve very low rates of auto ownership among residents, but the overall impact would be limited. It would not significantly shape visitor behaviour or create a low-traffic environment, due to the proximity of major roads such as Lake Shore Boulevard.

At the scale of the River District, however, the number of residents and employees would be large enough to achieve volume discounts for transit and new mobility services, creating a self-sustaining base of users.

Supporting and incentivizing electric vehicles would create streets within the River District that are quieter and less polluted.

All autonomous.

Sidewalk Labs believes that self-driving vehicles will likely become ready for widespread use as ride-hail services just as the first neighbourhoods in the River District are completed.

Sidewalk Labs has developed a proactive plan to harness the potential of self-driving vehicles to create safer streets that prioritize pedestrians, cyclists, and public transit, positioning the River District to pioneer a transportation network for the 21st century. Once self-driving vehicles are widespread, it will be possible to imagine entire neighbourhoods in which traditional cars travel only on Boulevards, with the rest of the streets reserved for self-driving vehicle use.

Sidewalk Labs seeks to maximize the mobility benefits of ride-hailing through staging areas, pick-up and drop-off zones, and shared-ride pricing. These initiatives aim to ensure that self-driving technology achieves the goals of expanding access to the city without a car, reducing household costs, and recapturing parking space for more vital public uses.

Self-supporting freight.

To reduce the impact of delivery trucks clogging city streets, Sidewalk Labs has designed a pioneering system that would consolidate most packages at a central location and deliver them through self-driving delivery dollies travelling through secure underground tunnels that connect directly into building basements.

This system would be a zero-emissions solution that would maintain or exceed convenience to customers.

It is not financially feasible to build and operate this system if the delivery zone is limited to a neighbourhood the size of Quayside. Sidewalk Labs anticipates that, together, Quayside and the River District would attract enough packages to make the construction of this system affordable and deliver savings to companies no longer responsible for delivering every package to its final destination.

All-electric.

In Quayside, Sidewalk Labs envisions several efforts to encourage the use of electric vehicles, consistent with Toronto's mobility objectives. But Quayside's noise and air-quality profile would be shaped more by Lake Shore Boulevard and the Gardiner Expressway than by the vehicles owned and operated within the neighbourhood.

At the River District scale, these strategies can begin to reshape the urban experience, as the majority of vehicle trips would be conducted by people who live and work in the neighbourhood. A variety of strategies — including discounts, priority lanes, or pricing — could be used to incentivize the transition. As a result, the streets of the River District could be far quieter and less polluted, offering a vision for a clean urban future.

Limited parking.

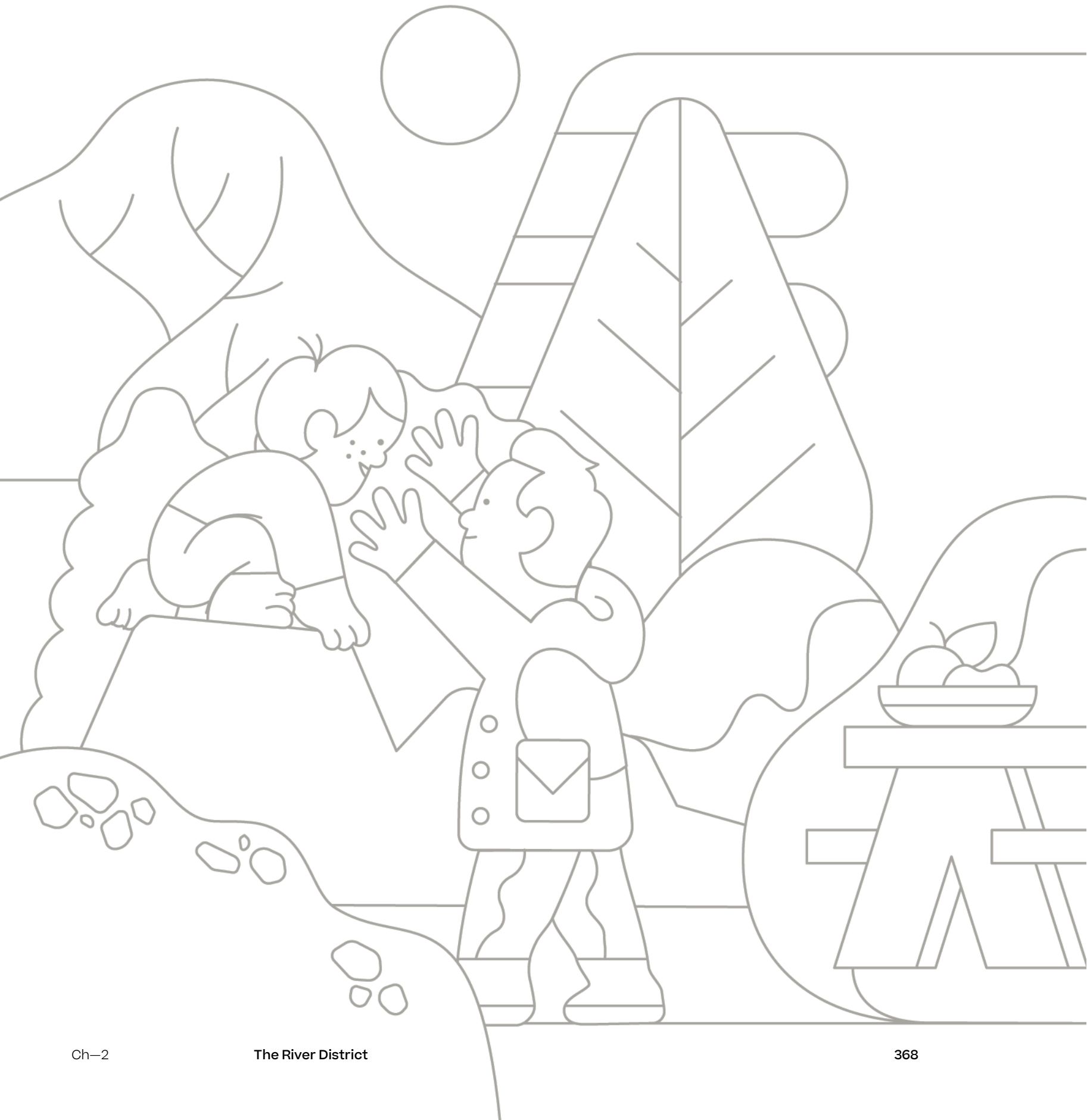
Similar to the strategy initiated in Quayside, the parking approach in the River District would eliminate fixed on-street parking spots in favour of dynamic pick-up and drop-off curb spaces. A reduced number of hourly parking spots would be offered in garages on site, with additional long-term spots offered at off-site facilities nearby. Spots within the neighbourhood would favour electric-powered car-share services.

Coordinating the network.

In Quayside, the proposed Waterfront Transportation Management Association (WTMA) — a new public entity tasked with coordinating the entire mobility network — can manage traffic congestion at the curb by using real-time space allocation and pricing to encourage people to choose alternative modes at busy times.

At the scale of the River District, however, active traffic management could yield far greater benefits, as the WTMA could not only optimize the available road and curb space but also apply pricing to encourage shared rides during congested periods. Active management would rely on a real-time understanding of the curbs, roads, weather, special events, and other factors, as well as the infrastructure tools to allocate lanes and signal times to achieve traffic objectives.

Public Realm



Creating an expanded, varied, and active public realm network

Expanding the public realm innovations initiated in Quayside across the River District would have a catalytic effect that goes beyond simply adding more parks. It would spark a wider variety of experiences, uses, and possibilities as part of a vast interconnected network.

Sidewalk Labs can build on the extraordinary foundation established by the renaturalization of the Don River⁴⁴ and outlined in the Port Lands Planning Framework by adding even more public spaces, supporting greater adaptability, improving all-season use, and creating new connections between streets, parks, plazas, and waterways.

Creative ways to expand public space.

Sidewalk Labs can build on its mobility strategies to generate significant new public space.



See the “Public Realm” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Public Realm” section.

Limiting vehicle lanes for cars would lead to expanded, landscaped sidewalks, some of which could become large enough to accommodate public installations such as pop-up markets, performances, and lush plazas. Dramatically reducing the number of space-intensive private garages would enable buildings to shrink their footprints,

creating space for a connected network of interior courtyards as well as winding pedestrian pathways that still maintain sight lines to ensure public safety.

These additional public connections can transform the public realm into its own kind of mobility network, offering a more intimate way to travel through a neighbourhood, which can strengthen community engagement, lead to healthier lifestyles, and spark unexpected connections.

In Quayside, these innovations can create 15 percent more open space than would be created by existing precinct plans.⁴⁵ But given that the neighbourhood is only four blocks long, the amount of extra space is modest in real terms.

When a similar approach is applied across an area the size of the River District, however, it would result in a significant increase in Toronto’s overall open space network, building on Waterfront Toronto’s vision to make public space the anchor for new communities.

Creating a greater variety of open spaces.

In its Quayside plan, Sidewalk Labs has sought ways to maximize the diversity of uses possible within a small space by breaking down the boundaries between indoors and outdoors, land and water, and green and hardscape. It has also explored ways to create adaptable spaces that can be repurposed for multiple uses — for example, enabling a range of sports to take place on the same field through the use of embedded lighting and other strategies.

Applied at the scale of the River District, this flexible, boundary-breaking approach can lead to an area unlike any other in Toronto, where it is possible to walk to nearly any point in 15 minutes and encounter a range of public experiences on the way — from kayaking along a river into the open harbour, to listening to a concert or playing mahjong on a series of floating barges, to rock climbing on old industrial infrastructure.

The River District’s innovation guidelines could ensure that public spaces are designed with the ability to adapt easily, so that as new cultural and recreational concepts emerge, the spaces can respond to meet the community’s needs.

Weather mitigation strategies to expand outdoor hours.

In a cold-weather climate like Toronto, wind, ice, and snow can make it challenging to be outside for much of the year. But the River District’s existing precinct plans highlight the need to create a public realm that can remain vibrant and accessible year-round.

To that end, Sidewalk Labs has explored a range of weather mitigation strategies that it would begin implementing in Quayside, including heated pavement that can melt ice and snow and canopies or building “Raincoats” that can extend over the street and connect to the sidewalk, creating airy, insulated pockets during inclement weather. Altogether, these strategies can increase the amount of time it is comfortable to be outdoors in Quayside’s public spaces by 35 percent.⁴⁶

But the most powerful tool to improve comfort is modifying the orientation of a street grid and the shape of buildings to reduce wind. Quayside’s small size and existing streets make it hard to deploy these techniques to their greatest potential.

Across the River District, these weather-mitigation approaches can have immense impact. Sidewalk Labs projects that if these strategies are implemented as part of the innovation guidelines, they could double the number of comfortable hours outside for key spaces, compared to a typical Toronto development.

Applying these innovations at the scale of the River District also makes them more affordable. Cost is particularly significant when it comes to materials like ETFE (Ethylene Tetrafluoroethylene), a durable, highly transparent, lightweight plastic film that is used for the building Raincoat and is ideal for creating comfortable indoor-outdoor environments.⁴⁷

In 2019, Sidewalk Labs designed and constructed a prototype; based on this work, Sidewalk Labs estimates that maturing the Raincoat technology and installing Raincoats at multiple locations within Quayside would lead to a 71 percent cost reduction per installation (relative to the prototype). There should be an even greater drop in expenses per square foot at the scale of the River District. This scale also affords a great opportunity to explore diverse architectural expressions.

An interconnected network that becomes a regional resource.

The River District would be developed within the context of an extraordinary new public realm network created by the flood-protection plan work currently underway.

That plan will create a new 30-hectare nature preserve that functions like a central park for the entire River District, providing access to a network of trails, expansive fields, waterways, hills, and wetlands. This green spine will extend through the Don River Valley itself, establishing pedestrian and cycling paths that run alongside the river for miles up the ravine, connecting to Don River Valley Park and other destinations.

The building Raincoat, which protects sidewalks from the elements, is part of a weather-mitigation system that could help double the number of comfortable outdoor hours in key spaces of the River District.



Sidewalk Labs believes that any public realm plan for the River District must take advantage of this exceptional resource and build on the principles it establishes for blurring the lines between water, wilderness, and land, integrating nature into urban life and using the public realm to strengthen connections across the city.

Such principles form the foundation of Sidewalk Labs’ public realm proposal for Quayside, but its contribution to the citywide network would be modest. At the scale of the River District, however, substantial new connections are possible — to the park and beyond.

The River District can extend the animation initiated at Parliament Slip through the Keating Channel, creating a vibrant series of land-water spaces brought to life by floating cafés, bars, and performance venues.

The River District could include unique public spaces such as the Keating Channel, featuring a canal with creative programming along both aides and pedestrian bridges linking neighbourhoods across the water.



Sidewalk Labs proposes a new pedestrian bridge over the Don River as it meets the inner harbour, connecting Villiers Island to Polson Quay through a continuous water-front walkway. This bridge would position the Polson Quay promenade to become a citywide attraction, making its spectacular views of Lake Ontario and downtown Toronto accessible to more people.

Within Villiers-Keating, Sidewalk Labs believes that multiple new pedestrian bridges across the Keating Channel could create a water-based beating heart of the neighbourhood, similar to great canal cities like Amsterdam or Venice.

An expanded ground-floor network would create new economic, creative, and programming possibilities

Across the River District, the stoa model can be claimed and interpreted by each neighbourhood to reflect its distinct needs and opportunities, reshaping the flexible ground floors to support everything from urban manufacturing to experimental retail to art, culture, and community spaces.

As described in greater detail in the “Quayside Plan” chapter in Volume 1, as well as in the “Public Realm” chapter of Volume 2, stoa is a flexible lower-floor space, frequently spanning two storeys, that can be adapted to serve a wide variety of neighbourhood and citywide needs.

In Quayside, stoa could help test new approaches to retail and experiment with integrating production, cultural, and community spaces into neighbourhoods. But with limited space, it would be impossible to do more than touch on the possibilities offered by this new model.

At the larger scale of the River District, there is an opportunity to implement a wider range of uses and to tailor the uses of each stoa space to support the unique and often changing needs of each neighbourhood.

While each community would feature a mix of retail, commercial, and social infrastructure spaces, some neighbourhoods could focus on workshop and production space while others might emphasize arts and cultural space. The size of the district would provide the critical mass of space to explore a wide variety of uses, reflecting the distinct character of each neighbourhood.

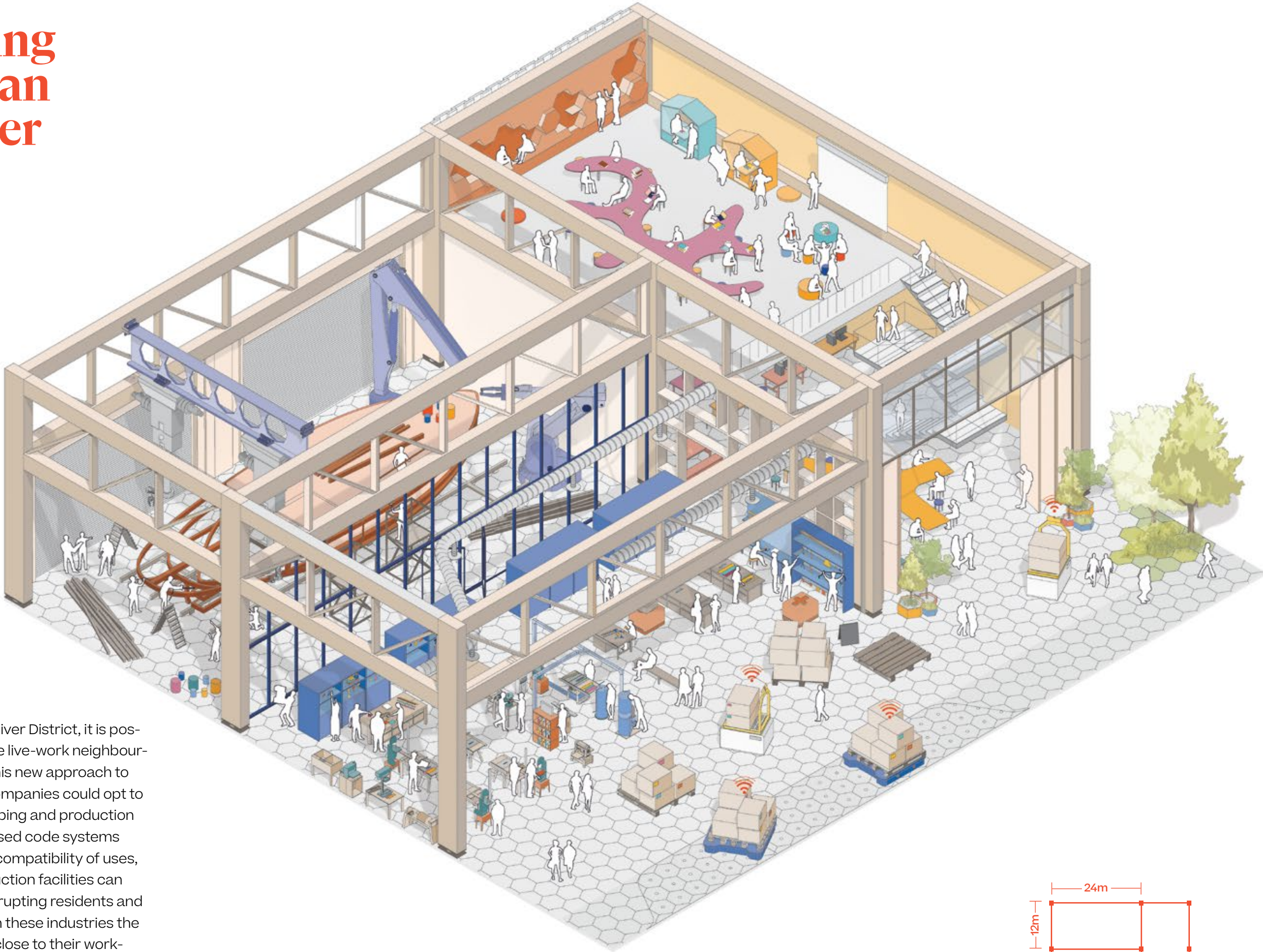
In Quayside, Sidewalk Labs proposes to take on the role of vertical developer (with local partners) and ground-floor property manager to demonstrate the viability of this new approach to lower-floor spaces. At the scale of the River District, the goal would be to have the private market adopt the stoa model — including flexible space and infrastructure, digital leasing and operations, and a highly diverse mix of uses — to serve community needs, provide jobs, and help create lively neighbourhoods.

Case study: Supporting the growth of an urban manufacturing cluster

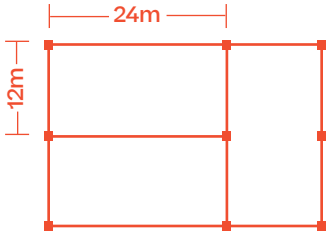
Manufacturing is once again resurgent in urban areas.⁴⁸ Businesses are finding success through new models, including prototyping products, producing and selling them on-site, and scaling their businesses in urban environments. Next-generation manufacturing is already growing in Toronto, which is part of why the City of Toronto has launched an initiative to create a Light Manufacturing Incubator for local startups.⁴⁹

In Quayside, stoa space would accommodate light manufacturing and shared fabrication equipment, creating opportunities for crossover between production and other industries — be it retail, art, culture, or food and beverage. But the site's small size and the need for diverse neighbourhood programming limit the amount of space that can be dedicated to exploring these connections and fostering this industry.

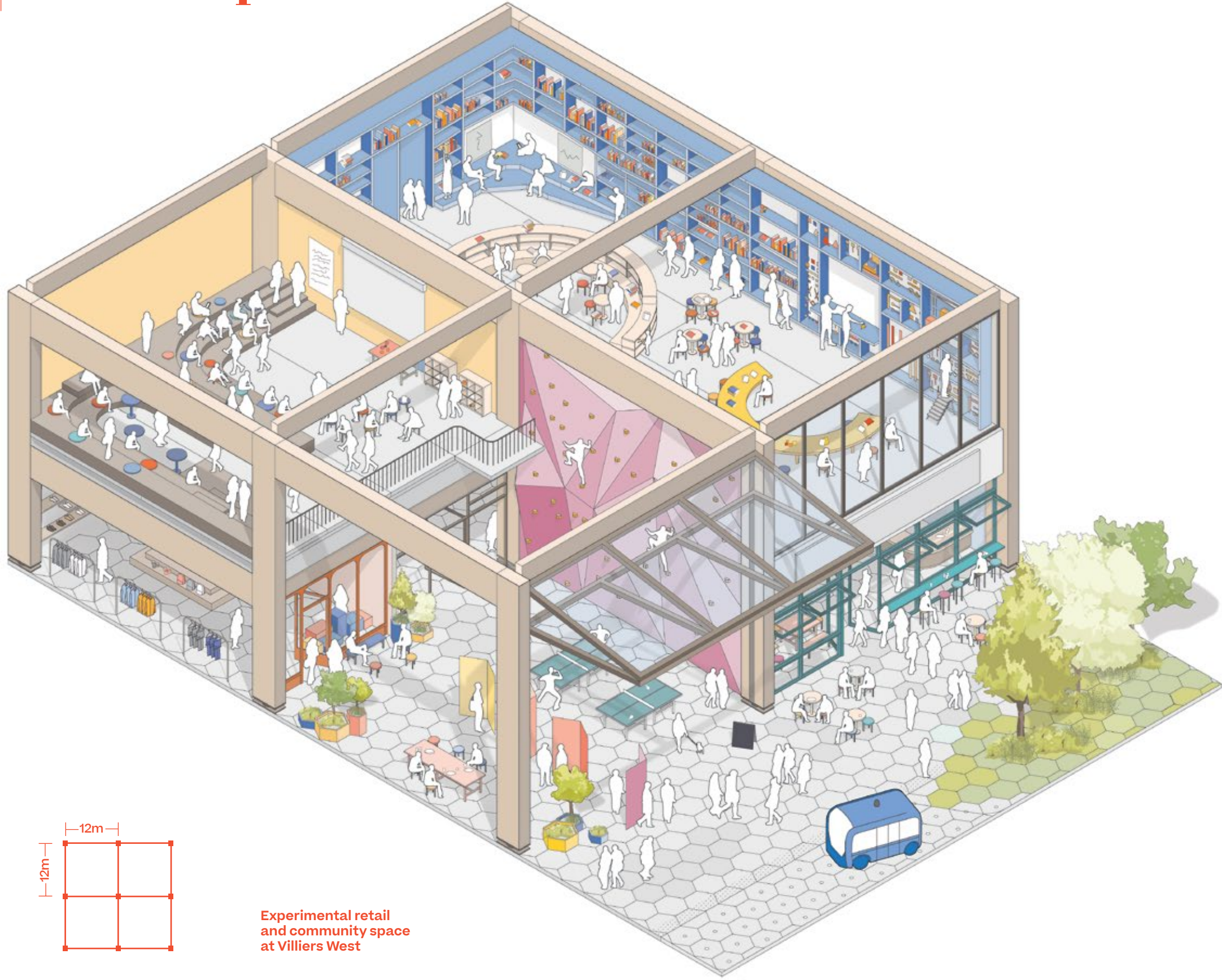
At the scale of the River District, it is possible to create whole live-work neighbourhoods defined by this new approach to the ground floor. Companies could opt to locate their prototyping and production there. Outcome-based code systems could facilitate the compatibility of uses, ensuring that production facilities can operate without disrupting residents and affording workers in these industries the opportunity to live close to their workplaces. The result can be a major catalyst for new jobs in Toronto that are complementary to the urban innovation hub at Villiers West and the Film District to the east.



Urban manufacturing at Polson Quay



Case study: Experimental retail integrated with community and cultural space



The Quayside plan aims to explore new models for retail, cultural, and community spaces within a neighbourhood, but Villiers West offers an opportunity to expand the most successful innovations to support the creation of a regional destination.

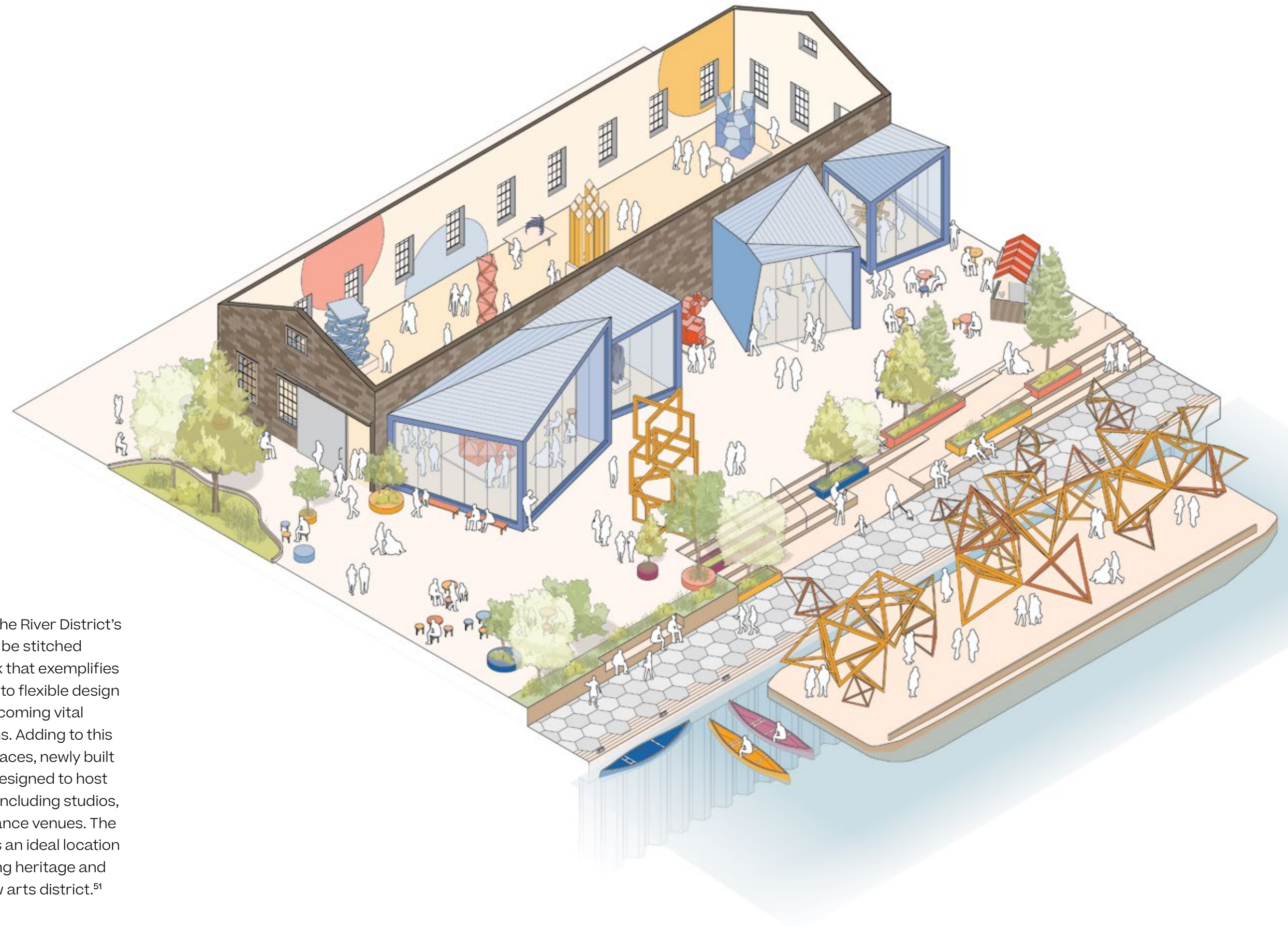
The innovation campus at Villiers West would be anchored by the Google Canadian headquarters and Urban Innovation Institute, drawing a working and visiting population interested in novel ideas and experiences. The adjacent Promontory Park is being developed by Waterfront Toronto as a resource for all Torontonians, with a particular focus on families and children. The proximity of these uses would provide a unique opportunity for the stoa space to showcase its range and adaptability.

The 290,000 square feet of lower-floor spaces in this area are an ideal setting to focus on retail innovation, where emerging businesses and leading brands can test new ideas. These efforts could range from computer vision-enabled payment systems to better integration of online and offline retail experiences. One example of an area that is ripe for innovation is food services. A place like the River District — animated at all hours with the Google campus, Urban Innovation Institute, and nearby parks — would provide a place to try new solutions, such as delivery robots, new food concepts, and urban agriculture.

Beyond enabling retail innovation, stoa's flexible approach creates unique opportunities to integrate community and cultural facilities instead of isolating them in stand-alone structures. Bringing these different experiences together can provide value — such as new foot traffic — to retail spaces and can improve community services by enabling complementary uses like clinics and pharmacies to be located close together.

At Villiers West, stoa can provide space for public programs to serve the population visiting the park, such as an environmental education centre or a museum. With the continuous, varied stream of visitors, the adaptability of stoa can help spaces evolve to serve different purposes from day to night, weekday to weekend, and season to season.

Case study: Arts production



Arts and production at
heritage buildings at
Keating Channel

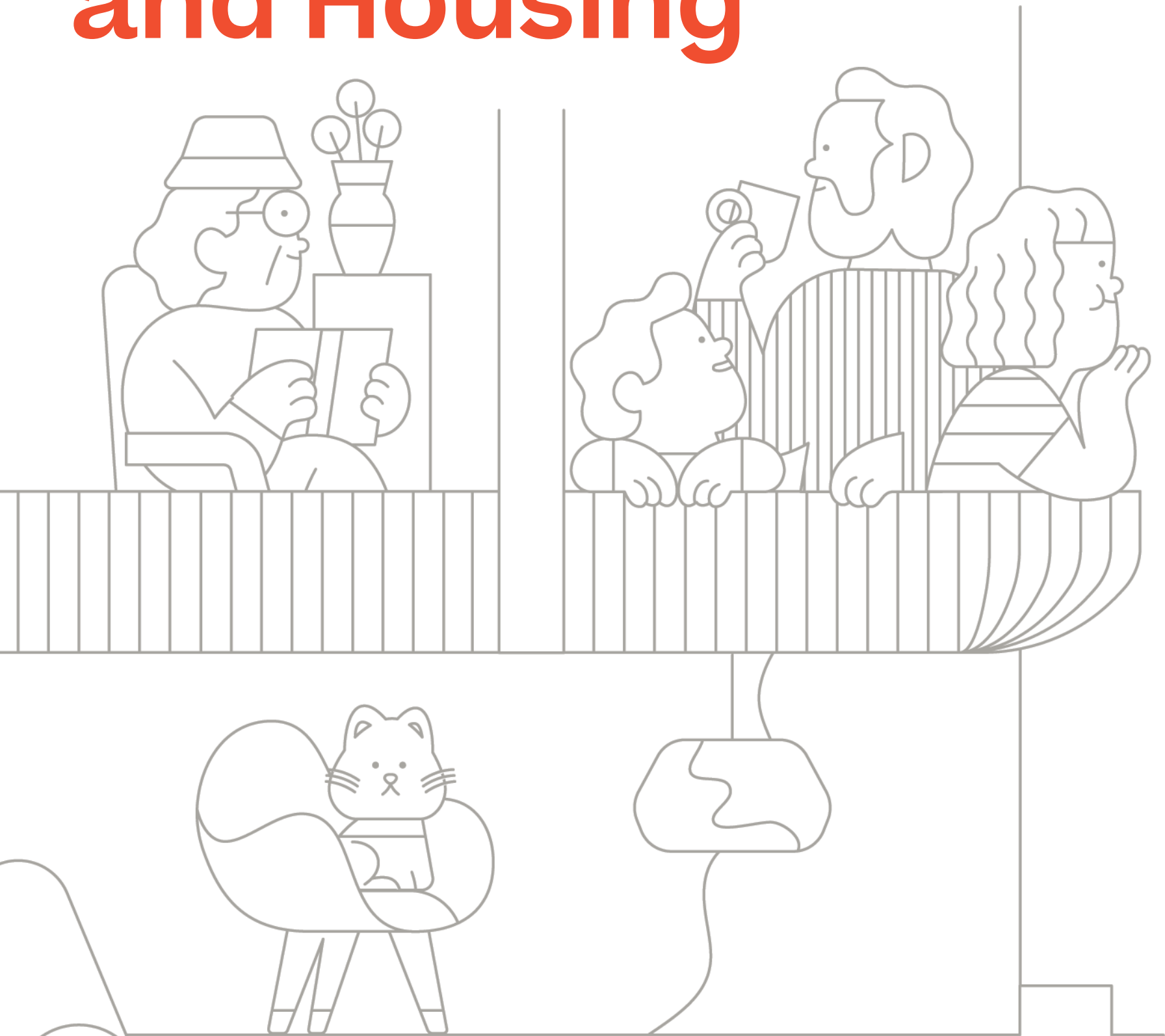
Around the world, revitalized port areas have been energized by the reclamation of historic buildings, which mix the past, present, and future in stunning and powerful ways. Artists have frequently led these projects. For NDSM in Amsterdam, a group of artists and skaters defined, designed, and led the reclamation of a former industrial shipyard.⁵⁰

Unlike Quayside, the River District contains a range of heritage industrial structures that are ideal sites for this kind of reclamation. New leasing and equity models could ensure long-term opportunities for creative production. Some of the sites, such as the Dominion Box Boards building in Polson Quay, already have a vibrant community of artists working there and ready to lead.

Historic spaces within the River District's neighbourhoods could be stitched together into a network that exemplifies innovative approaches to flexible design and adaptive reuse, becoming vital community destinations. Adding to this inventory of existing spaces, newly built stoa spaces could be designed to host cultural and arts uses, including studios, galleries, and performance venues. The Keating Channel area is an ideal location for this approach, mixing heritage and new structures in a new arts district.⁵¹

The River District could become a clear destination for millions of Toronto's visitors further cementing the city's global identity as a world-class leader in cultural production.

Buildings and Housing



Catalyzing a new mass timber industry and construction supply chain

Catalyzing the growth of a sustainable mass timber buildings industry and a new factory for modular construction would create 2,500 jobs, accelerate construction timelines by up to 35 percent, and reduce overall construction costs.

Mass timber, a sustainable building material made from compressing multiple pieces of timber, is increasingly popular as a construction material, with at least 21 timber towers above seven storeys in construction or completed within the past five years.⁵² As strong as steel and twice as strong as concrete by weight, mass timber is also easier to manufacture, faster to assemble, and dramatically more sustainable than traditional construction materials. A single building can be the environmental equivalent of taking hundreds of cars off the road.⁵³

With nearly 40 percent of the world's sustainable forests, Canada is well-suited to capitalize on this emerging material.⁵⁴ But there are very few facilities in North America that can process the quantity of materials needed for even a single building, let alone a larger development. As a result, Canadian mass timber projects have frequently had to import

treated wood from Europe,⁵⁵ a lengthy and expensive process that negates some of the cost and sustainability gains the approach would otherwise afford.

To improve the local economy and catalyze a new industry around sustainable mass timber, Sidewalk Labs plans to support the launch of an Ontario-based factory.⁵⁶ This new supply chain would begin with local foresters and sawmills creating the baseline mass timber pieces, which would then be sent to the factory to be cut into assembly-ready building components, with local general contractors performing the on-site assembly.

This unique combination of emerging materials and a streamlined construction process could transform the industry — accelerating timelines, improving predictability, reducing costs, minimizing



See the “Buildings and Housing” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Buildings and Housing” section.

A new local factory
could accelerate
construction
projects by up to

35%

Factory-based construction of building parts would result in less waste, better working conditions, and streamlined regulatory approvals.

neighbourhood disruption from work sites, and yielding a healthier, more sustainable, and stunning built environment.

These benefits only become possible at the scale of the River District.

But these benefits only become possible with a development area that is large enough to support the creation of a new local mass timber industry, the investment required to build and operate a new factory, and the time and expense required to invent new digital tools that can facilitate design and permitting.

While Quayside's size — it consists of only 10 buildings — is too small to support a re-conception of the entire construction supply chain, the River District would provide the developable area to achieve the full power of this approach. Sidewalk Labs estimates that roughly 6 million square feet of development are needed to justify an investment in the factory-based production of mass timber, as well as for such a factory to hit peak efficiency in producing sustainable building components on a predictable timeline that developers can trust.



A new local factory that processes wood into mass timber components could accelerate construction projects by up to 35 percent, reduce construction costs below current market rates, and significantly improve predictability for developers.⁵⁷ Rather than crowding worksites with cranes, trucks, and staging for construction materials, this factory-based process would allow much of the work to take place off-site, resulting in less noise and traffic disrupting the neighbourhood and a smaller, safer construction site that completes its work more quickly.

By planning holistically for development that includes the River District, Sidewalk Labs could have a functioning factory operational by 2021, in time to support the development in Quayside and to achieve the construction speed benefits there.

Generating thousands of jobs and dramatically reducing greenhouse gases.

Unlocking the potential of Canada's forests as part of the River District development could generate about 2,500 new full-time jobs.⁵⁸ These impacts could grow beyond the waterfront, as more designers and developers tap into this new pipeline for an array of projects. They could be supported by additional local factories and foster a growing ecosystem of Canadian industries that contribute to the supply chain: fabricators, foresters, sawmills, loggers, and more.

Despite the scale of development, the impact on the forests would be negligible. Even if the entire River District were constructed out of mass timber, it would still represent less than 1 percent of the total amount of wood grown in Canada's certified forests each year, which could be replenished with just a few days of forest growth.

The environmental benefits of mass timber construction also increase significantly at scale. For example, the wood required to build the River District would sequester over 600,000 tonnes of carbon, the equivalent of taking more than 127,000 cars off the road per year.⁵⁹

A factory-based approach to mass timber construction could generate 2,500 person-years of full-time employment over a 20-year period.

Achieving new levels of housing affordability, choice, and inclusivity

Creating housing across the scale of the River District would unlock powerful private funding sources that could generate over \$1.4 billion and make significant progress towards the city’s affordability goals. With additional public-sector support, this private funding could help create more than 13,600 below-market units while providing new housing options that can accommodate a wide range of household needs.

No issue is more pressing in Toronto right now than housing affordability, but the tools that exist today to address this challenge are limited. Below-market units are increasingly expensive and difficult for the government to deliver, and housing options could better respond to the needs of residents.

Sidewalk Labs has identified a set of private funding sources that can help support an ambitious vision for below-market housing: the increased value of public land due to factory-built timber construction, a condo resale fee, and new value created by more efficient unit design (an approach called “affordability by design”). These efforts could be supported by

an expanded mix of housing options that create the foundation for a more diverse and inclusive community.

These ideas would be initiated in Quayside, but its small size means that their impact would be limited. At the scale of the River District, however, these approaches can offer a vision for the future of housing, with the potential to unlock over \$1.4 billion. With additional public-sector support, this private funding could help create more than 13,600 below-market units. That would include 6,800 affordable housing units, representing nearly a third of the current annual citywide target for new affordable rental housing units.

Three new private sources could direct a portion of the value generated by the innovations deployed across the River District to below-market housing. Sidewalk Labs proposes that these funds would be managed by a new entity known as the Waterfront Housing Trust. The trust would be operated by the public sector — not by Sidewalk Labs — and it would be responsible for assembling and disbursing funding to below-market housing in the River District.

1

Unlocking \$639 million in land value with factory construction.

Sidewalk Labs projects that its new modular factory approach would generate significant value for developers. The buildings could use the factory’s library of parts, which would have already been reviewed by city agencies and designed to fit together seamlessly, reducing the risk of delays and accelerating construction time by up to 35 percent.⁶⁰ These benefits would enable developers to complete more projects, at a lower cost, within a given time frame than they do today.

Developers who recognize this value should be willing to bid a higher price for the land, much of which is publicly owned. These higher land value payments to the government, realized on all publicly owned parcels across the scale of the River District, could generate an estimated \$639 million that could be directed towards affordable housing.

2

Generating \$321 million with a condo resale fee.

A permanent 1 percent resale fee could be applied on the resale of all condos in Quayside and the River District to support affordable housing. Assuming recent market trends for individual unit turnover, each condo could contribute an estimated total of \$23,000 towards below-market housing through 2050. Sidewalk Labs would agree that the fee could be implemented within its own development in Quayside to demonstrate that the impact on condo sales would be negligible and not affect pricing. But those relatively modest fees compound with scale, and over time they could generate an estimated \$321 million across the River District.

Generating \$1.4 billion in private funding to support a 40% below-market housing vision

	Quayside		Full proposed IDEA District	
Funding sources for 40% below-market program	Below-market program achieved*	\$M	Below-market program achieved*	\$M
Traditional public sources	20%	\$115	25%	\$2,492
Existing government programs**	13	77	10	997
Land value or other gov't contributions	7	38	15	1,495
New private sources	7%	\$37	15%	\$1,435
Affordability by design	7	37	5	475
Factory-driven land value	0	0	7	639
Condo resale fee***	0	0	3	321
Sidewalk Labs contribution	13%	\$77	-	-
Total sources	40%	\$229	40%	\$3,927

* These figures reflect the incremental impact of each source towards creating a below-market program, based on overall 40 percent below-market program cost of \$229 million.

** Existing government program figures are estimated for Quayside based on recent awards and the proposed below-market housing program. These figures assume programs are scaled up across the IDEA District on the same basis as in Quayside. As a result, totals may exceed annual budget allocations pending timeline of affordable units coming online between 2024 and 2048.

*** Analysis assumes 2.5 annual percent inflation rate.

Achieving new levels of housing affordability, choice, and inclusivity

3

Creating \$475 million in value through affordability by design.

Sidewalk Labs’ proposed efficient and ultra-efficient units, as well as co-living housing options, offer a new way of living for Toronto residents that goes beyond the typical downtown dwelling. While these apartments have a smaller footprint than traditional units, smarter design can ensure that they adapt better to meet the needs of increasingly diverse Torontonians, from seniors looking to age in place as part of an active community to families looking to put down roots on the eastern waterfront.

Expanded community spaces and a larger public realm can supplement efficient apartments, providing access to more experiences, resources, and support. For example, rather than having a rarely used dining room large enough to host the occasional special event, residents could access a communal kitchen and dining room stocked with a range of equipment that would require vast amounts of space to store in a personal kitchen (and spend most of the year untouched). Additional features designed to provide adaptability over time could include walls that are easy to move, allowing families to grow or shrink their units as needs change.

The ability to design efficient units that are comfortable and attractive can also contribute to affordability. Reducing the unit’s footprint allows developers to build more total units. Sidewalk Labs proposes that a percentage of this increased revenue potential be directed towards affordable housing.

At the scale of the River District, this approach to “affordability by design” can create \$475 million in value that could be applied towards below-market housing.

Over 34,000 new residential units would offer unprecedented variety.

The promising models initiated in Quay-side for increased rentals, co-living options, and new pathways to ownership like “shared equity” — which enables residents to own part of their home and rent the rest — can only impact a small fraction of Toronto’s households. While a substantial percentage of units would be below-market housing, the neighbourhood’s total unit count would limit the number of non-profit partners that can realistically participate.

The River District has the scale to demonstrate the true potential of new housing options and to engage a range of developers, including traditional developers, non-profit organizations, and innovative

These new housing options can attract and keep a diversity of residents on the waterfront, helping to create the foundation of a thriving and inclusive urban community.

Achieving new levels of housing affordability, choice, and inclusivity

companies rethinking housing models. Once the most successful ideas are expanded across the scale of the district, they can begin to broaden housing options for people across the city.

For Toronto families who face the tough choice between long commutes and family-friendly living, the River District can help to establish city living as an option

for a lifetime. And for families finding traditional home ownership out of reach, the River District can establish renting or shared equity as viable options.

These new housing options can attract and keep a diversity of residents on the waterfront, helping to create the foundation of a thriving and inclusive urban community.

Potential number of housing units at the full proposed IDEA District

At the full proposed scale of the IDEA District — including Quayside and the River District neighbourhoods, as well as the optional participation of Keating West — the housing vision could deliver 34,000 units. That supply includes 13,600 below-market units, supported by new private funding sources as well as additional government support.

	Quayside		IDEA District	
Funding sources for 40% below-market program	%	# units	%	# units
Total market housing	60%	1,560	60%	20,400
Total below-market housing	40%	1,040	40%	13,600
Affordable (<100% AMR)	20	520	20	6,800
Below-Market (100–150% AMR)	20	520	20	6,800
Total	100%	2,600	100%	34,000

Sustainability



Achieving climate positivity requires bold solutions only possible at scale

Eliminating greenhouse gas emissions requires entirely new approaches to designing and operating infrastructure and energy management systems. That kind of dramatic reinvention can only be effective and financially feasible when applied across a broad area and supported by strong cooperation between the public and private sectors.

Waterfront Toronto has established the objective of creating a climate-positive community on the eastern waterfront, meaning that the Sidewalk Toronto project must do more than eliminate greenhouse gas emissions within the district — it must actually contribute to lowering the city’s overall emissions.

Toronto and Ontario have taken tremendous strides towards lowering their greenhouse gas emissions, eliminating coal-fired generation in Ontario⁶¹ and embracing policies like TransformTO that support the expansion of electrification, improve building energy efficiency, and nearly eliminate landfill waste.⁶² But studies show that most new construction could end up using as much energy as existing buildings.⁶³

Achieving the urgent goal of climate positivity requires a dramatic reinvention of how major infrastructure systems are built and operated; the way energy is generated, transported, and consumed; and the partnership model between the public and private sectors.

Sidewalk Labs has proposed a range of new energy solutions to address this challenge, beginning in Quayside, where its initiatives would result in an 85 per cent reduction of greenhouse gases.⁶⁴ But these initiatives proposed are not economically feasible to deploy in Quayside unless they are part of a comprehensive approach that spans a large enough geographic area to support inventing, implementing, and operating this entirely new ecosystem of sustainable infrastructure.



See the “Sustainability” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Sustainability” section.



Map Proposed energy infrastructure in the River District

The River District’s advanced energy infrastructure would capture a variety of clean energy sources to provide heating, cooling, and domestic hot water.

- IDEA District
- Neighbourhood plant
- Mini plant
- Thermal grid
- Geoexchange fields
- Solar and battery storage in all buildings

- Proposed Enwave connection
Waste heat recovery
- Commercial data centre
Waste heat recovery
- Cherry Street Sewage
Pump Station
Waste heat recovery
- Expansion of possible
industrial tenants
Waste heat recovery

- Ashbridges Bay Wastewater
Treatment Plant
Waste heat recovery
- Anaerobic digestion facility
Biogas creation
- Local power plant
Waste heat recovery

Sidewalk Labs believes the River District is large enough to generate a customer base capable of sustaining the capital costs of major new infrastructure and the expense of designing, building, and installing digital technologies to manage these new systems.

Specifically, to keep Quayside resident energy bills in line with Toronto averages, the advanced power and thermal grids would require a \$19 million supplemental innovation investment based on the current plan, due to factors including the high cost of geothermal exchange and initial electric grid connections, in addition to the poor economies of scale for operating costs. While this is not financially sustainable at the scale of each neighbourhood, no additional supplemental innovation investment would be required to extend operations into the River District beyond Villiers West, because the systems scale in a financially sustainable way.

There are three areas where scale is particularly essential to achieving a climate-positive community: mobility, electricity, and energy data.

1
Creating a more sustainable mobility system.
Increasing transportation options.
Expanding mobility options across the eastern waterfront — including extending public transit, enhancing walking and cycling networks, and using policy tools to encourage shared trips — would create convenient, affordable mobility alternatives to the private car, leading to dramatic greenhouse gas emission reductions across the River District.
Using scale to reach an all-electric mobility system. While Quayside is too small to reshape mobility patterns, the River District provides an opportunity for transformative change. Policy tools, from pricing incentives to widespread electric charging across the district’s extensive street network, could accelerate the use of electric vehicles.

2

Making full electrification affordable.

Buildings are responsible for 60 percent of Toronto’s greenhouse gas emissions,⁶⁵ with the overwhelming majority of those emissions (87 percent) generated by the burning of on-site natural gas for heating and hot water production.⁶⁶

Ensuring that all heating in new construction is electric, rather than relying on natural gas, is critical to making a serious dent in greenhouse gas emissions. But electricity prices can be significantly higher than natural gas prices due to the high cost of electricity generation, transmission, and distribution infrastructure. Without radical reductions in energy demand, electrifying neighbourhoods has the potential not only to increase the cost of heating and hot water for local customers, but also to increase electricity rates citywide, as the costs for enlarged electrical infrastructure gets spread across all ratepayers.

Sidewalk Labs has developed a comprehensive set of strategies to make full electrification affordable, but these efforts rely on a business model that requires implementation over a broad geographic area. They include:

Reducing energy demand. Energy-efficient building designs can drive down the amount of energy needed to heat and cool buildings, without sacrificing comfort, through improved building insulation, airtight construction, and other techniques inspired by the Passive House movement. These approaches can be paired with digital energy “Scheduler” tools designed to optimize energy use. At the River District, these savings could be 17 percent.

Designing an advanced power grid. Sidewalk Labs proposes to collaborate with Toronto Hydro and technology providers to design an advanced power grid that would integrate energy management strategies and clean energy sources, such as solar power and battery storage, to reduce the need to draw from the main grid at peak times, when the grid is frequently forced to draw on fossil fuel-based sources to meet demand. The grid would include pricing and rely on the aforementioned Scheduler tools to help shift energy use away from peak times.

Developing a thermal grid. Sidewalk Labs proposes implement a thermal grid with electric heat pumps to provide cooling, heating, and domestic hot water to buildings. The thermal grid is designed to exchange thermal energy between buildings and to draw from a variety of clean energy sources, such as wastewater heat, deep lake cooling, and industrial waste heat. Existing buildings in the River District would have the option either to continue to use natural gas or to use the thermal grid.

At the scale of the River District, electrification becomes affordable as a result of the cumulative benefits of smarter energy management; new and increased sources of clean energy; economies of scale in infrastructure development and maintenance; and a larger customer base across which to spread the costs of setting up and administering a business, including the new metering and billing platforms for the advanced power grid and thermal grid.

3

Realizing energy targets with the help of building data.

Studies show that a building’s actual energy use in operation can be far greater than what is shown by a model submitted for energy code compliance. This disconnect is known as the “performance gap.” In its study of nearly 100 buildings in Toronto, Sidewalk Labs found the performance gap to be 13 percent, meaning buildings use more energy when actually up and running than when modelled prior to construction.⁶⁷

Sidewalk Labs has developed two approaches to not only help close the performance gap but enables cities to establish real-time operational energy targets (instead of design-based, pre-construction targets).

Deploying real-time metering. Real-time metering of all energy systems (such as heating, cooling, lighting, and equipment) would enable comparisons between actual energy performance and design-based projections, creating a feedback loop for architects, engineers, and developers to help close the performance gap and improve the energy efficiency of buildings.

Tying energy outcomes to energy codes. In Quayside, Sidewalk Labs proposes to deploy an energy auditing tool called “Perform” that would incorporate factors such as occupancy, tenant type, and weather to create dynamic targets for energy use intensity. At the scale of the River District, Sidewalk Labs would plan to work with the city to use this type of tool to develop operational energy targets based on real-time metering for new buildings — not on pre-construction designs.

Because Quayside’s development program consists of only 10 buildings, the neighbourhood would create a limited amount of data points to develop actionable insights related to energy use.

But the River District’s greater scale of diversely programmed buildings could help to accumulate a critical mass of building data, leading to powerful insights that can inform building design and enable new approaches to energy use regulation.

Getting over the finish line to climate positivity

With all of Sidewalk Lab’s sustainability and mobility initiatives in place, there would still be a small amount of greenhouse gas emissions that the district would be responsible for: roughly 0.72 tonnes per capita per year, which is an 89 percent reduction from today’s Toronto average.⁶⁸

River District sustainability
By the numbers:
→ 89% reduction in annual per capita GHG from Toronto average
→ 11,000 annual tonnes of CO2 offset by anaerobic digestion
→ 70,444 annual tonnes exported by thermal grid

This amount is due to several factors that are outside of the district’s control, including the fact that Ontario’s power grid is very clean but not completely fossil-free,⁶⁹ and that insufficient space exists to generate and store all of the electricity needed to avoid using the main power grid when natural gas-fired power generators are being used. If changes in technology allow, the first priority would be to further reduce on-site emissions.

While the River District would approach carbon neutrality, climate positivity is evaluated by a project’s impact on the city’s overall greenhouse gas emissions. By definition, this means that a district must find ways to export clean energy beyond the project area or actively reduce Toronto’s current greenhouse gas emissions.

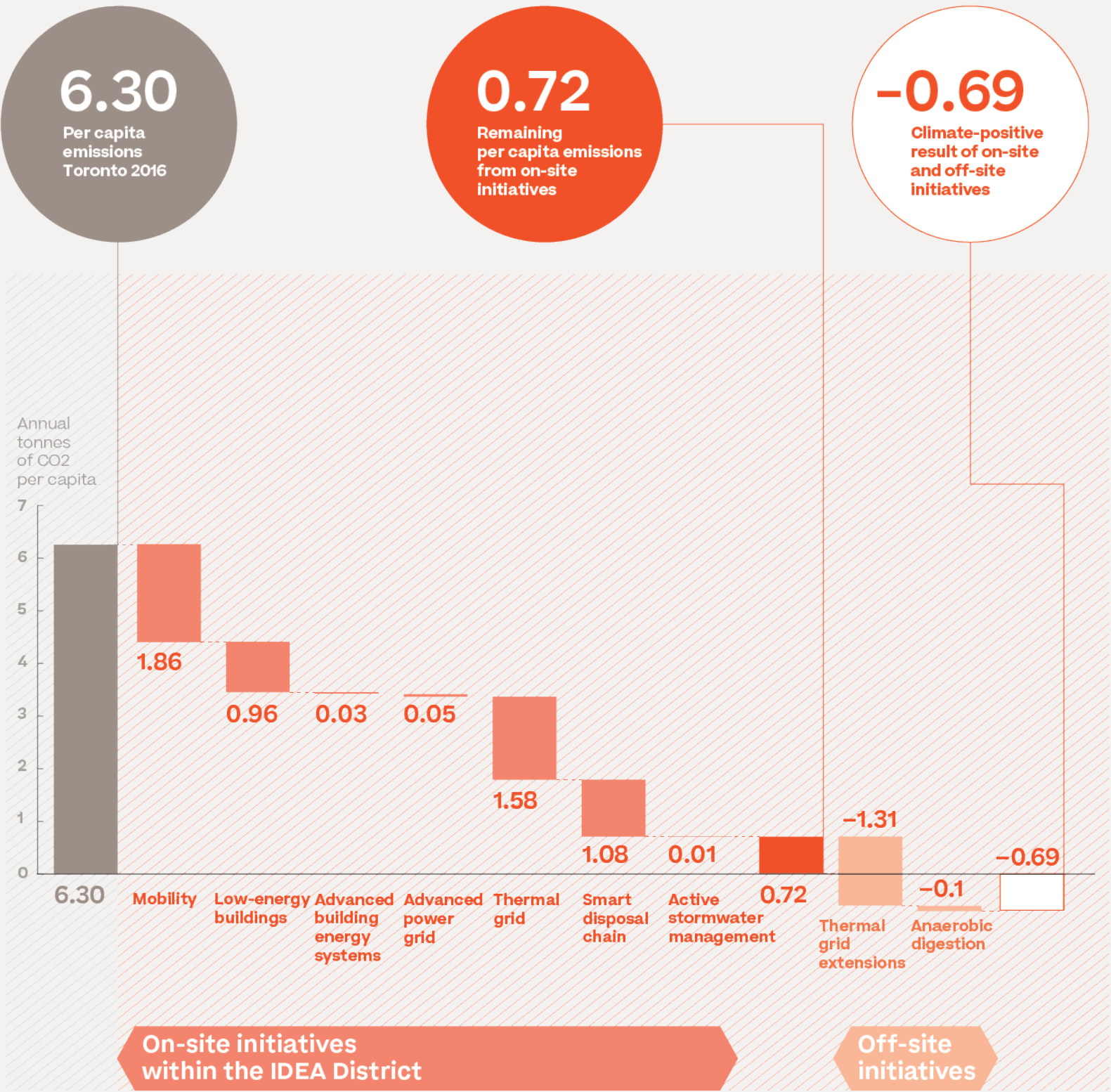
Sidewalk Labs has identified two clear opportunities to achieve climate positivity: a potential generator of biogas and a major source of waste heat.

Building an anaerobic waste digestion facility.

The River District would generate an estimated 45,150 tonnes of source-separated organic waste annually — enough to make it economically feasible to partner with a local operator to build an anaerobic digestion facility to process organic material and turn it into biogas. A facility serving the River District would produce nearly 1.3 megawatts’ worth of biogas. This approach could achieve nearly 11,000 annual tonnes of CO2 offset, pushing the project into climate-positive territory.

The River District would contribute to lowering the city’s overall emissions, thereby becoming a climate-positive community.

The path to achieving a climate-positive district



Note: Because the estimated GHG reductions shown here are based on a combination of design, technology, and behaviour change, Sidewalk Labs expects unforeseen shortfalls at the neighbourhood scale of Quayside.

The sustainability systems proposed in this plan include self-correction and learning mechanisms (such as advanced energy management tools and a smart disposal chain) that should reduce these variations as development proceeds across the IDEA District.

As a result, Sidewalk Labs has reduced the sustainability plan’s expected GHG outcomes 10 percent in Quayside and 5 percent at the full scale of the IDEA District.

The scale of the River District makes it a credible model for cities on the journey to radically reduce greenhouse gas emissions.

Tapping into the energy potential of Ashbridges.

The largest potential source of energy that the River District could tap to achieve climate positivity is the nearby Ashbridges Bay Wastewater Treatment Plant. Sidewalk Labs has calculated that the effluent from Ashbridges could provide 150 to 200 megawatts of thermal energy potential, creating a surplus of clean energy in the project area that could enable the project to export 70,444 annual tonnes of CO₂.

Sidewalk Labs would seek permission to partner with the city's Toronto Water division to extend the proposed thermal grid infrastructure to tap into the waste heat generated at Ashbridges, with a commitment not to impact the plant's operations.

Priority outcome spotlight

Achieving the largest climate-positive district in North America

The River District would become the biggest, densest climate-positive district in North America and the third largest in the world, after announced projects in Jaipur, India,⁷⁰ and Seoul, South Korea.⁷¹

Waterfront Toronto has already set the goals for this in motion with its Lower Don Lands application to the C40 Climate Positive Development Program.⁷² The River District expands the scope of this project into additional adjoining neighbourhoods, and the MIDP aims to chart the path for the practical implementation of these goals.

The scale of the River District makes it a credible model for cities on the journey to radically reduce greenhouse gas emissions. Its size means that it cannot cherry-pick businesses and building activities to artificially lower emissions. Instead, this development must attract and support business and light industry of all kinds, including those with high energy demands.

Further, since the River District would consist of predominantly new construction served by a very clean Ontario power grid, it lacks the easy wins that other projects can claim, like shuttering a coal-fired district heating plant. Instead, its strategy must focus on challenges that all cities face: the transformation of mobility systems and the affordable electrification of heating, hot water, and light industry.

An opportunity to use waste as a resource

At scale, waste can be used as a resource rather than going straight to a landfill. Waste from the River District would be recovered, recycled, and used to create products or energy — a cycle known as the “circular economy.”

At the River District, Sidewalk Labs would seek to match its target in Quay-side to divert 80 percent of waste from landfill, exceeding the city’s goal of diverting 70 percent and dramatically surpassing the current diversion rates from Toronto’s average multifamily and commercial buildings, which range from 13 to 27 percent.⁷³

But the sheer volume of waste generated at a scale like the River District presents new opportunities to rethink the entire waste stream and pioneer new business models to ensure the waste does not ... go to waste.

Sidewalk Labs estimates that 240,000 tonnes of waste could be generated annually across the River District, of which 192,000 tonnes (80 percent) would be diverted. This waste can be repurposed in local facilities, creating circular economies.

In this virtuous cycle, recycled materials would be sorted and sold to specialized recycling centres that process the material and sell it back to manufacturers for use in new products. Organic waste like food could be processed at a new anaerobic digestion facility and exported as fuel to heat buildings outside of the River District.

Building a new facility to convert recycled materials into new products.

The scale of the River District would make the construction of a local materials recovery facility (MRF) financially feasible, and Sidewalk Labs would look to partner with a third party to create such a facility.

Recycling can be complicated, and people frequently make mistakes, contaminating the recycling stream. MRFs separate commingled recycling streams into individual materials, such as glass, plastic, and metal, and try to remove that

contamination. This “clean” and sorted recycling can then be sold to facilities and scrap yards to be repurposed.

MRFs can receive higher prices for cleaner materials. If the incoming stream of recyclables to the MRF is highly contaminated with non-recyclable material, it becomes impossible to fully clean it, leading to more expensive processing costs at the MRF and lower market value for the materials.

To improve the cleanliness of the recycling and organic waste streams that leave the community, Sidewalk Labs has developed a digital strategy to provide real-time feedback to residents and tenants on how to improve their recycling — efforts that could yield one of Toronto’s cleanest waste streams. But Quayside is

too small to support its own MRF, meaning that its recycling would still need to go to a shared facility, where the materials from surrounding communities would be combined and processed together, making it virtually impossible for Quay-side to secure the cost benefits of its superior recycling.

By contrast, Sidewalk Labs projects that the River District would generate 118,000 tonnes of glass, metal, and plastic recyclables, nearly 25,000 tonnes of cardboard, and 42,000 tonnes of paper annually. That is enough material to support a dedicated MRF that would enable the waterfront to reap the full economic benefit of its clean recycling streams.

Those revenues could be significant: cleaner waste streams could reduce MRF processing costs by as much as 28 percent while increasing the value of its recyclables by more than \$10 million annually. The new facility’s proximity to the district would also reduce the environmental and financial cost of transporting materials to a MRF that is farther away.

Sidewalk Labs estimates that 240,000 tonnes of waste could be generated annually across the River District, of which 192,000 tonnes (80 percent) would be diverted.

Cleaner waste streams could increase the value of recyclables by more than **\$10 million** annually.

An expanded public realm could minimize the need for grey stormwater infrastructure

Dramatically expanding the public realm across the River District would bolster the potential for green infrastructure to improve stormwater treatment and reduce flood risk. The new plantings could significantly reduce the need for grey infrastructure, generating significant savings and freeing up space for more public uses.

Sidewalk Labs proposes to use green infrastructure to manage the flow of stormwater. This approach provides environmental benefits, an enhanced public realm, and reduces the need for expensive treatment and storage infrastructure, generating cost savings to the city and to private developers.

When expanded across the scale of the River District, the implementation of green infrastructure as a natural flood-mitigation strategy can begin to provide significant cost savings, including reducing or even eliminating the need for water quality treatment facilities that would typically be required for new development, in addition to the environmental and public realm benefits. This approach would include improved bio-retention,

with hundreds of thousands of cubic metres of soil and plantings distributed across the district to absorb water on the ground. Blue and green roofs, with the ability to detain and store water before it reaches the ground, would be installed on most buildings.

Despite these strategies, some “hard” stormwater infrastructure, such as cisterns, would be required, but their size and cost would be minimized by the introduction of digital tools to manage flows more efficiently. Together, these systems would prevent over 90 percent of the average annual rainfall from entering the stormwater collection facilities.⁷⁴



See the “IDEA District” chapter of Volume 3 for more details on the proposed Open Space Alliance.

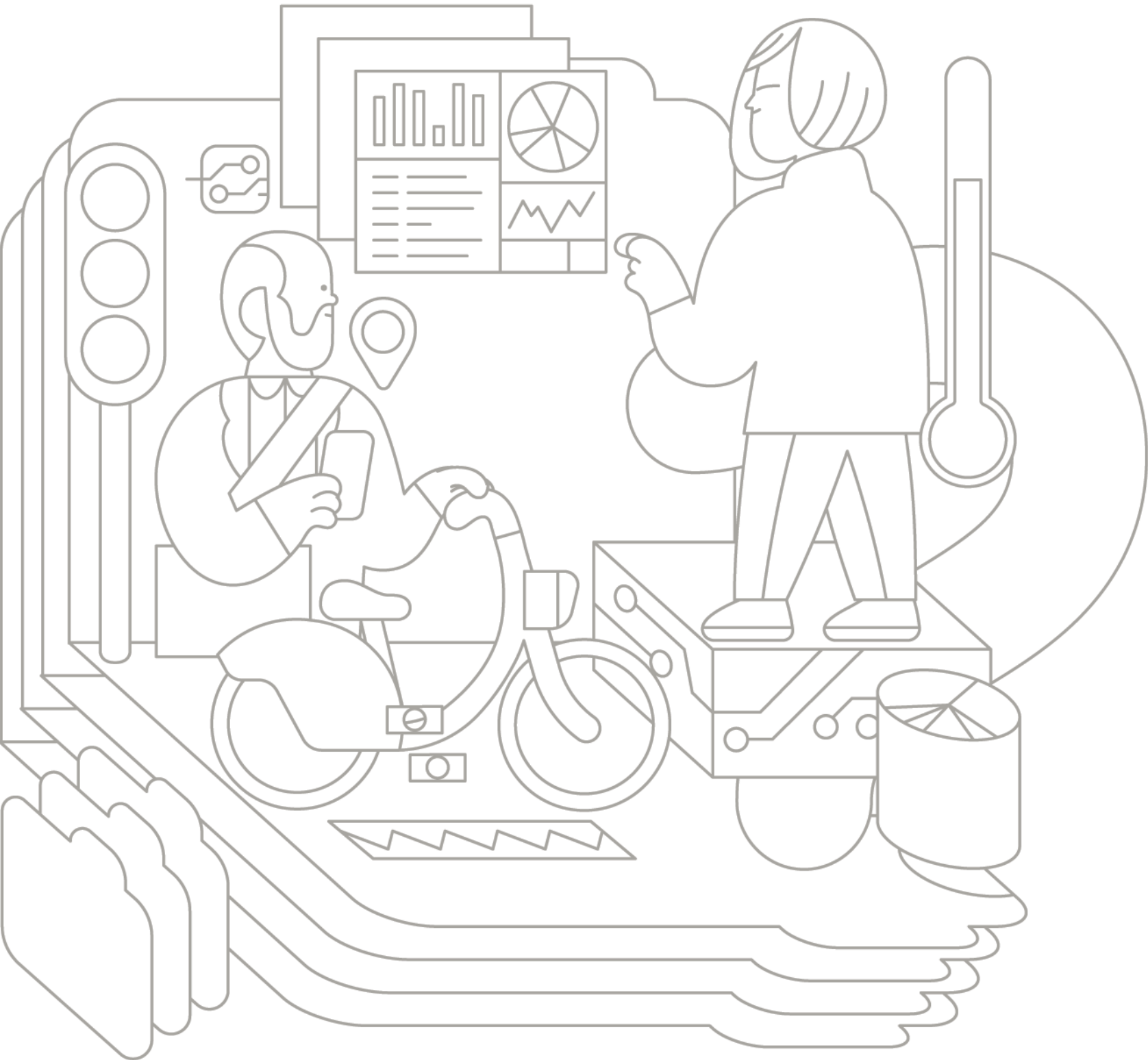
These approaches could be implemented as alternative ways to meet water quality standards that would reduce or potentially eliminate the need for the large treatment facilities, which are expensive to build and use significant amounts of energy to operate.

To avoid burdening Toronto Water with ongoing maintenance of green stormwater management infrastructure in the public realm, Sidewalk Labs proposes that the management of these engineered natural systems be taken on by the Open Space Alliance, a proposed new non-profit entity that would manage the River District’s public realm.

Today, developers pay to build and maintain water management infrastructure within their sites. Under this new approach, developers would give the Open Space Alliance an upfront green infrastructure fee that would cost less than the on-site facilities that would otherwise have been required. They would also provide a monthly maintenance fee to the alliance that would be the equivalent of what they would have spent maintaining those facilities.

Advanced stormwater systems would prevent over 90 percent of the average annual rainfall from entering the stormwater collection facilities.

Digital Innovation



Catalyzing the growth of an urban innovation cluster

The River District would foster the creation of a digital innovation cluster and attract innovators from around the world by providing more affordable and flexible digital infrastructure, setting data standards that are open and secure, creating a trusted process for responsible data use, and launching a baseline set of digital services for third parties to build on.

Flexible, affordable digital infrastructure becomes viable at scale.

Digital infrastructure is a basic building block of the future city — creating connectivity that helps residents, companies, organizations, and local agencies use data to launch new services that improve urban life. It is also the catalyst for new services or businesses no one has thought of yet and the cornerstone of a digital economy. Sidewalk Labs proposes deployment of two primary types of digital infrastructure: ubiquitous connectivity and standardized mounts.

This advanced network only becomes financially sustainable at the scale of the River District, given the number of residents or businesses needed to recoup the initial investment in core enabling infrastructure. Deployed at a larger scale, this connectivity would enable residents to use their own private network everywhere — from their couch to a park bench — and enable businesses to explore new ideas.

Mounts. To significantly reduce the cost and installation time of launching new digital innovations, Sidewalk Labs has designed a new type of “Urban USB port” that would provide a physical mount, power, and connectivity to digital devices (such as Wi-Fi antennae, traffic counters, or air-quality sensors) fixed to street poles and traffic signals. Sidewalk Labs estimates that its mounts could reduce

Connectivity. Waterfront Toronto has worked to ensure that fast internet connectivity across the waterfront is not a luxury for the few — but, rather, the new standard. Building on this progress, new advances in fibre-optic technology and network security could offer residents and businesses access to secure, super-fast internet connections at an affordable cost.



See the “Digital Innovation” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Digital Innovation” section.

Standardized mounts could reduce device installation time by

92%

the time of the fixed-mount hardware installation by roughly 92 percent — down from 30 hours today to two hours.⁷⁵

The proposed mount requires significant geographic distribution to gain the widespread adoption needed for device manufacturers (such as Wi-Fi antenna producers) to incorporate the standard into their own designs, just as existing USB ports needed to prove their worth before laptop and phone manufacturers made them standard features. The River District would provide the necessary scale for development and adoption of the standardized mount.

Core digital services can help catalyze an ecosystem.

A true ecosystem of urban innovation requires a catalyst that makes it possible for third parties to build new digital applications, services, products, or tools that improve people's lives.

To serve as that catalyst, Sidewalk Labs proposes to launch a limited set of digital services — including the mobility management, energy management, and outdoor comfort systems described in earlier parts of this chapter — that are currently not being pursued by the market but are essential to achieving Waterfront Toronto's quality-of-life objectives in Quayside and the River District. These proposed services (including their purpose, data collection sources, and some potential third-party applications) are listed in detail in the “Digital Innovation” chapter of Volume 2.

Beginning at the scale of the River District, the urban data that these services make accessible to others could enable countless new innovations to emerge from local companies, entrepreneurs, startups, researchers, agencies, civic groups, and others.

As explained more in the “Economic Development” chapter of Volume 1, Sidewalk Labs estimates that these conditions for digital innovation could lead to roughly 10,500 urban innovation sector jobs at the proposed scale of the River District. That might include anything from a next-generation bike-share service, to small business tools that help retailers launch a successful pop-up, to civic tools that help families find an affordable home, to improved building designs that reduce energy, to new apps that bring people together outdoors.

The list is bound only by imagination.

Ensuring open standards and responsible data use.

Digital infrastructure and services would enable the River District to generate a critical mass of urban data that could be used to develop new services, apps, and systems to help tackle urban challenges. But to ensure this information is easily usable by entrepreneurs, researchers, government agencies, and community members across Toronto, Canada, and the globe, it must be standardized, open, and publicly accessible.

Sidewalk Labs plans to achieve its goal of a digitally open city by publishing data in standard formats — enabling third parties to build on top of urban data in new and important ways. At the scale of the River District, a non-profit Urban Innovation Institute could promote these standards and provide a core hub for open data discussions and use.

Another core condition for digital innovation is instilling trust from the community that information collected in cities would preserve the privacy of individuals and be used for the greater good.

Beginning in Quayside, Sidewalk Labs proposes the creation of a publicly accountable independent entity called the Urban Data Trust. This entity would be tasked with establishing clear guidelines

for responsible data use as well as overseeing a process for reviewing and approving all proposals to collect or use urban data in the project area (including all proposals from Sidewalk Labs).

This responsible data use process would apply in addition to existing Canadian privacy laws, and the Urban Data Trust should coordinate with privacy regulators as necessary.

The Urban Data Trust should be launched in Quayside, where it could begin to work through use cases. Over the longer term, once the entity has benefited from many use cases in Quayside and certain parts of the River District, Sidewalk Labs expects that the Urban Data Trust could have broader coverage.

An independent Urban Data Trust would oversee a process for reviewing and approving all proposals to collect or use urban data in the River District.

The Future Can Start Now

Toronto does not have to wait decades to take advantage of the eastern waterfront. Sidewalk Labs proposes a series of **activation strategies** that can begin reconnecting Torontonians to this area and introducing the **possibilities of its future**.



The opening of 307 on June 16, 2018, featured pop-up Market 307 with Scadding Court Community Centre, as well as First Nations Dancers EJ Kwandibens, Sagatay, and Nicole Leveck. Credit: Sidewalk Labs

While the long-term transformation of the eastern waterfront will take decades, the Port Lands Planning Framework recognizes that it is important to begin animating these sites with experiences that reflect the overall mission and values of the future neighbourhoods.

This approach is grounded in the principles of creative placemaking — an evolving field of practice that leverages the power of the arts, culture, and creativity to drive a broader agenda for change, growth, and transformation in ways that also build character and quality of place.

One of the biggest challenges for new developments is that time is often the most powerful tool for creating diverse communities. This factor is why many new developments may initially feel sterile or uninviting. It takes time for people to accrue experiences, create a history, and share memories. The strength of a new community is also much greater when people have been involved from its initial conception through development.

That is why Sidewalk Labs created 307, a public workshop and creative platform for the local community, located in Quayside. Since the launch of 307 in mid-2018, more than 11,000 Torontonians have visited the space to participate in workshops, provide feedback on ideas, propose solutions to urban challenges, see new prototypes, or engage with emerging local artists.

Over the coming years, Sidewalk Labs would like to build on this experience, working with Waterfront Toronto, the City of Toronto, and local businesses and organizations to develop programs that inspire people to experience the Port Lands in new ways or even for the very first time. It would do this work in collaboration with the local landowners.

Key sites for early activation might include temporary floating installations in Parliament Slip and the Keating Channel; a pop-up park at Polson Quay; and underutilized heritage structures throughout the area.

Potential early activations

Sugar Beach
A potential stop on a summer ferry route



Yonge Slip
A downtown departure point for summer pop-up ferry service

Parliament Slip
A ferry stop and floating barge with community and cultural events



307
Ongoing prototypes (such as this building Raincoat), public art, and programming at 307, the Sidewalk Labs innovation workspace on Quayside



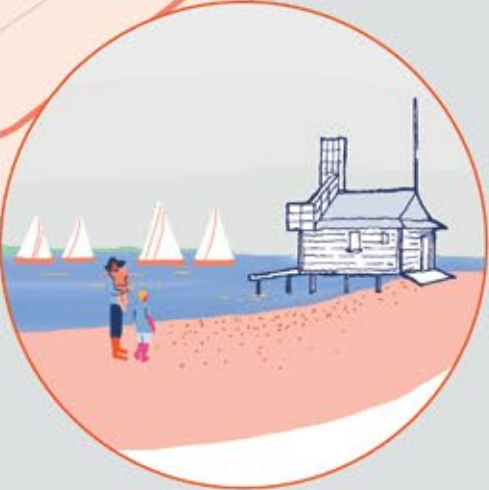
Polson Quay
A pop-up park and connection to artist studios



Keating Channel
A floating barge with performances and art installations connected to heritage buildings



Cherry Beach
Refurbished bike lanes through the Port Lands to reach Cherry Beach and the outer harbour



Public art installations and festivals can draw people to the eastern waterfront and provide new, delightful perspectives on the area

The waterfront has the potential to become an epicentre for Toronto's arts community. Public art is already interwoven into new developments like the West Don Lands; Icebreakers, a series of public art installations, is celebrated annually along Queens Quay; and Max Dean, one of the city's most acclaimed artists, has an extraordinary studio in a heritage building on Polson Quay filled with kinetic and interactive sculpture.

This growing cultural energy led to the creation of a new waterfront Toronto Biennial of Art that will launch in the fall of 2019. The event will take place every two years, offering accessible and transformative visual art exhibitions, installations, talks, learning opportunities, and happenings in new and unexpected spaces along the shores of Lake Ontario.

Sidewalk Labs has sought to contribute to this momentum, partnering with local arts groups to support projects that let people experience the lake in new ways. In summer 2018, Art Spin created the Kajama Boat Tour, which repurposed a historic tall ship as a performance vessel

that traveled around the harbour, staging site-specific performances at locations from the Turning Basin to the Eastern Gap.

In winter 2019, projection mapping artist Kavi created an interactive installation on the proposed prototype for a building Raincoat that is designed to protect Torontonians during inclement weather.

For future projects, Sidewalk Labs envisions integrating an Indigenous perspectives. Towards this end, Sidewalk Labs and Waterfront Toronto worked with the Brook Mollroy Indigenous Design Studio to bring together Indigenous artists and designers to discuss Indigenous design principles and how state-of-the-art technology might intersect with the richness of Indigenous design.

Potential upcoming projects include design competitions for Indigenous artists to interpret how to create indoor-outdoor structures that can draw people outside year-round, as well as workshops with local schools and community members to create augmented-reality apps that bring to life the long history and stories of the land.

Toronto singer-songwriter Bruno Capinan performs during the Art Spin Kajama Boat Tour in August 2018. Credit: Priam Thomas for Art Spin, 2018



An interactive installation by Toronto artist Kavi takes place on a building Raincoat designed by Toronto architecture firm PARTISANS, in March 2019. Credit: David Pike



Temporary creative projects can make the eastern waterfront more accessible, for more people, right away

The Port Lands is currently only accessible through public transit by bus 72, which runs every 15 minutes from Union Station and follows a route along Commissioners Street. Seasonally, bus 172B runs to Cherry Beach. This limited service means that most of the time, the south Port Lands — including Cherry Beach, Cherry Beach Recreation Fields, Tommy Thompson Park, and the Marinas — are not accessible by public transport.

Sidewalk Labs is prepared to fund, design, and operate a summer pop-up ferry service that could be piloted with Ports Toronto from Yonge Slip or Parliament Slip to other parts of the Port Lands, making it accessible and fun for people from across Toronto to visit the area. The ferries could be exclusively electric watercraft.

There is currently a separated bike path through Cherry Beach that is part of the Martin Goodman Trail. But the connection into the city and to the central waterfront is along Cherry Street and is not well-marked, making it dangerous and uninviting for cyclists to travel alongside heavy trucks.

In partnership with the city, Sidewalk Labs is prepared to fund a project to refurbish these lanes, which could include painting the existing bike lane along Cherry Street in a heavy colour. That would make Toronto's growing cycling community feel invited to this area and start establishing the future connection between the park and the city.

Over the coming years, Sidewalk Labs would like to work with the city to develop programs that inspire people to experience the Port Lands in new ways.

Endnotes

General note: Unless otherwise noted, all calculations that refer to the full River District scale are inclusive of the IDEA District's entire proposed geography, including Quayside and all currently privately held parcels (such as Keating West). Unless otherwise noted, all currency figures are in Canadian dollars.

Charts note: Sources for the charts and figures in this chapter can be found in the accompanying copy for a given section; otherwise, the numbers reflect a Sidewalk Labs internal analysis. Additional information can be found in the MIDP Technical Appendix documents, available at www.sidewalktoronto.ca/midp-appendix.

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**The River District
has the potential to
become a globally
recognized centre
where urban
innovations emerge,
grow, and flourish.**

Eco- nomic Develop- ment

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A New Economic Engine to Drive Job Growth on an Accelerated Timeline

Sidewalk Labs’ approach to economic development can help Toronto realize the full potential of the eastern waterfront on a significantly expedited time frame, resulting in more than 93,000 total jobs stimulated by the IDEA District by 2040.¹

Any comprehensive approach to urban development requires a strong plan for economic growth with an equally strong commitment to inclusion.

In recent years, all three levels of government in Canada have recognized the importance of inclusive growth. These efforts have included federal investment in public transit and affordable housing, community benefit agreements on provincial projects, and social procurement initiatives at the city level. Waterfront Toronto recognized this need in its 2017 Request for Proposals for Quayside, establishing as one of its primary objectives the need “to deliver key economic and social benefits that enable Toronto to compete effectively with other top-tier global cities for investment, jobs and talent.”²

Waterfront Toronto also identified a focus for this growth: an economic cluster centred around urban innovation. Broadly defined as the ability to tackle pressing city challenges using new physical, digital, or design advances, “urban innovation” is a burgeoning sector whose global market value is projected to top \$2 trillion USD by 2025.³ But despite the vast potential for urban innovation to spark economic growth, no one place has put together a holistic plan to become the global hub of this emerging field.

The Sidewalk Toronto project provides a unique opportunity to help meet and exceed government and Waterfront Toronto goals for inclusive growth by generating a new economic engine — one designed specifically to improve quality of life, affordability, and prosperity for residents, workers, and businesses of all sizes. Sidewalk Labs proposes a two-part approach to economic development with the potential to catalyze significant jobs and growth anchored around urban innovation.



The innovation plan.
First, Sidewalk Labs plans to help boost general economic growth by accelerating development across the underutilized areas of the IDEA District.

This effort involves unlocking new neighbourhoods through upfront investments in critical infrastructure, such as light rail transit; relocating Google’s Canadian headquarters to Villiers West as part of a new innovation campus; and implementing a general approach to people-first planning that aims to attract talent through a vibrant mix of homes, offices, shops, civic amenities, and open spaces. Together these efforts would help create an “expanded downtown” area capable of supporting new and existing industries, including the growing film industry in areas adjacent to the IDEA District.



IDEA District

The 77-hectare Innovative Design and Economic Acceleration (IDEA) District, consisting of Quayside and the River District, provides sufficient geographic scale for innovations to maximize quality-of-life impact and to become financially viable.

Inside the numbers

How Sidewalk Labs estimated economic impact

To help predict and measure the impact of this approach to economic development, Sidewalk Labs engaged urbanMetrics, a leading Toronto-based firm with extensive experience on the waterfront. The urbanMetrics analysis, detailed throughout this chapter, demonstrates both the one-time and recurring benefits associated with Sidewalk Labs' proposal, compared to an incremental approach to development based on prevailing land-use policies and planning trends.

The urbanMetrics analysis compared two scenarios. The first (baseline) scenario created by urbanMetrics is based entirely on the current set of government-created planning documents for the project geography (including zoning where it exists, precinct plans, and the Port Lands Planning Framework). This scenario does not make any assumptions about how implementation of proposals in these documents might evolve in the future.

The second scenario is based on the proposed MIDP plan and accounts for specific elements and planning approaches that differentiate these plans from traditional development, including creating the conditions for a cluster in urban innovation, deploying factory-based mass timber construction for the entirety of the program, and using widespread mixed-use design at both the neighbourhood and building level. This second scenario considered the IDEA District to refer to its proposed full geographic scope, including Quayside and the River District.

The results of that report suggest that the economic impact of the project would deliver on the high expectations that Torontonians have for the enormous potential of the waterfront.

Critically, Sidewalk Labs recognizes that its approach to accelerating development must benefit everyone. To plan for prosperity with equity, Sidewalk Labs commits to a robust inclusion program, anchored by an ambitious housing vision that provides 40 percent of units at below-market rates. Building on that foundation, Sidewalk Labs plans to launch a new workforce development program, implement a construction jobs program for equity-seeking populations, and invest in an Ontario-based mass timber factory capable of supporting approximately 2,500 person-years of full-time employment over 20 years.

Second, Sidewalk Labs plans to help catalyze a cluster focused on urban innovation with the potential to spark a new economic engine.

This effort aims to build on Toronto's existing assets in emerging fields of technology and urban design by creating the unique physical, digital, and policy conditions that would enable innovators, entrepreneurs, and companies large and small from around the world to research, explore, build, and scale ideas that can improve the quality of life in cities. This approach involves establishing the IDEA District as a designated zone subject to a special set of regulatory and policy tools to promote innovation and accelerate development.

To further jumpstart this cluster, Sidewalk Labs plans to help launch an independent, non-profit Urban Innovation Institute — designed in collaboration with local academic institutions — to serve as a new epicentre for applied research focused on urban challenges.



The impact.

Application of Sidewalk Labs' approach in Quayside is a critical first step in realizing the city's goals and the economic potential of the waterfront; it is expected to result in 3,900 direct jobs and a one-time vertical construction impact of \$1.6 billion in value added to the Canadian economy alone. These impacts would extend to the River District, resulting in a total of 93,000 jobs (including 44,000 full-time "direct" jobs), \$4.3 billion in annual tax revenue, and \$14.2 billion in annual GDP — all delivered on a far more accelerated timeline compared to plans in place today to activate the waterfront.⁴

In addition to these ongoing impacts beginning at completion in 2040, the project would also realize cumulative property taxes of \$1.6 billion.

Sidewalk Labs believes the majority of jobs located within the IDEA District would be "net new," meaning jobs that would not otherwise exist in Toronto but for the creation of the district. While Sidewalk Labs recognizes that a portion of the total direct jobs would relocate to the district from elsewhere in Toronto, far more would be new additions to Toronto's economy, driven in part by the establishment of an urban innovation cluster. The historically low vacancy rates in Toronto's downtown core also suggests that if the IDEA District did attract tenants from existing buildings downtown, there would continue to be demand to fill that newly vacated space.



Benefits of implementing the vision

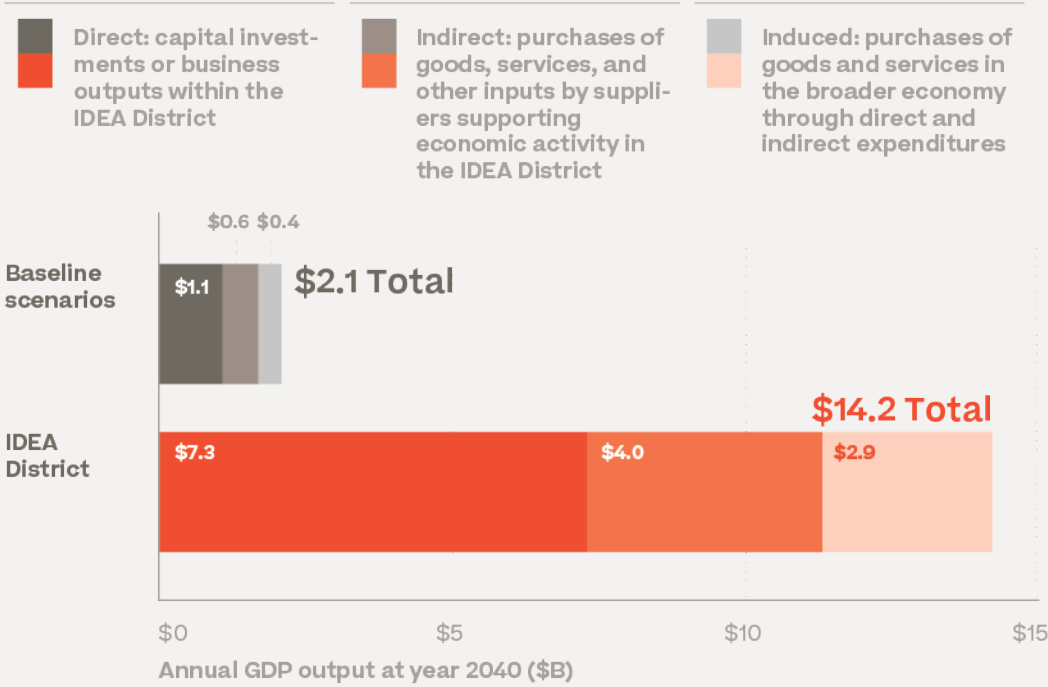
- More than 93,000 total jobs (including 44,000 full-time, permanent jobs)
- Roughly \$14.2 billion in annual GDP output beginning in 2040
- Roughly \$4.3 billion in annual tax revenue (federal, provincial, and municipal) by 2040
- A global hub for urban innovation, anchored by a new Google campus, a new applied-research institute, and a new venture fund for Canadian companies

This growth would enable all three levels of government to maximize the return realized on the \$1.25 billion investment⁵ made as part of the Don Mouth Naturalization and Port Lands Flood Protection Project; allow Toronto to realize more than triple the cumulative property tax revenues over the baseline scenario from the area within the same time frame; and deliver both critical public transit infrastructure and thousands of affordable housing units decades earlier than anticipated.

The IDEA District’s significant economic impact on GDP, tax revenue, and jobs by 2040

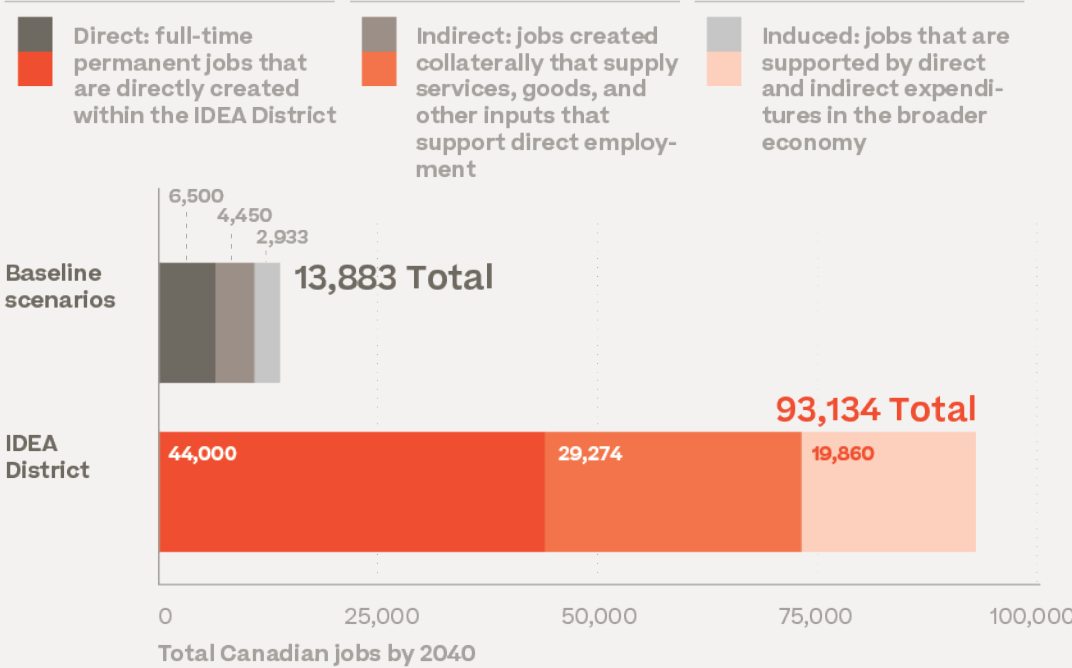
Nearly seven times the annual GDP contribution by 2040

In its analysis, urbanMetrics estimates that, by 2040, the IDEA District would contribute nearly seven times the value to Canadian GDP annually than would result from existing proposals for the eastern waterfront. Sidewalk Labs recognizes that there are many factors that could contribute to increased value aside from the unique conditions established in the IDEA District, such as a potential increase in commercial and residential density. The baseline scenario assumed the densities as currently considered in existing planning documents.



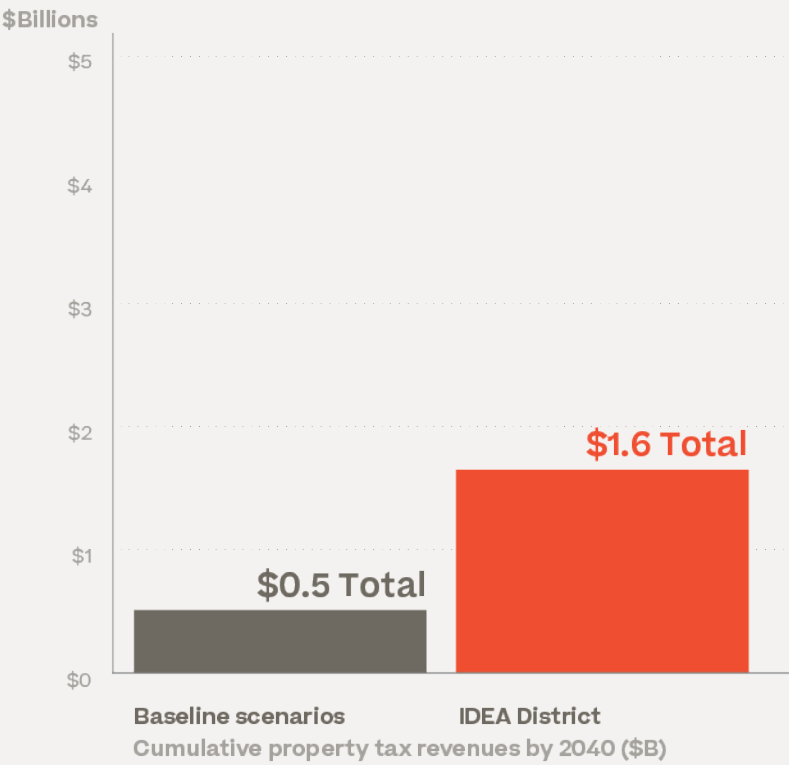
Nearly seven times as many jobs by 2040

Implementation of Sidewalk Labs’ plans for the IDEA District could realize significantly greater permanent employment opportunities, achieved on a faster timeline, than existing proposals. In its analysis, urbanMetrics estimates that, by 2040, the IDEA District would stimulate more than 93,000 jobs — nearly seven times the number of jobs by 2040 that would be realized under the approach currently envisioned in the Port Lands Planning Framework.



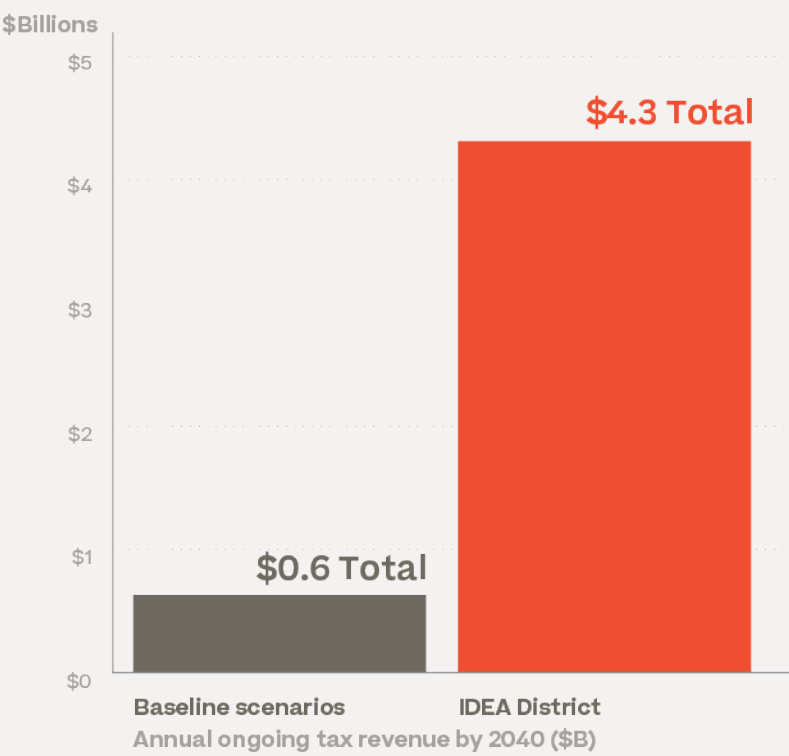
Three times the cumulative property tax revenue by 2040

Accelerating development of the eastern waterfront would allow for a rapid accumulation of property tax revenues generated upon expedited occupancy. In its analysis, urbanMetrics estimates that, by 2040, full buildout of the IDEA District would accrue more than three times the cumulative property tax revenue of that generated under existing proposals.



Nearly seven times the annual ongoing tax revenue by 2040

The urbanMetrics analysis also estimates that overall annual tax revenues generated throughout the IDEA District would be realized at a magnitude nearly seven times that of the baseline scenario by 2040. Importantly, a fully developed IDEA District would have the capacity to produce this annual benefit across municipal, provincial, and federal jurisdictions.



The above revenues include personal tax, corporate tax, property tax, and other taxes.

Accel- erating Develop- ment

By extending public transit, establishing a major jobs anchor, designing complete communities, and supporting new industries, the IDEA District can boost economic growth on a faster timeline than existing plans for the area — and do so in a way that preserves equity for all.

Introduction



Strategies

1
Unlock the waterfront through infrastructure investments

2
Anchor waterfront growth with a new Google campus

3
Attract talent and jobs with complete communities

4
Support new and existing industries with an “expanded downtown”

5
Plan for prosperity with equity

Sidewalk Labs’ plans for Quayside and proposed approach for the IDEA District would help the city and Waterfront Toronto unlock the potential of this underutilized area on an accelerated timeline, creating the conditions for significant new economic growth. Part 1 of this chapter outlines the steps necessary to lay that foundation.

Realizing the full potential of the IDEA District begins with early delivery of the planned Waterfront Light Rail Transit extension, which would not only better connect the area with the rest of the city but also with other planned development nearby, including commercial development at East Harbour and the planned expansion of the Film District.

Realizing the full potential of the IDEA District begins with early delivery of the planned Waterfront Light Rail Transit extension.

As a next step, the relocation of Google’s Canadian headquarters onto Villiers Island as part of a new innovation campus would spark economic activity and draw businesses and talent from around the world. A thoughtful approach to mixed-use development that integrates new innovations to improve sustainability, affordability, and mobility would further attract workers and residents by creating complete communities filled with homes, jobs, shops, community spaces, and parks.

Finally, new affordable housing and workforce development programs help ensure that this approach to prosperity also comes with equity — creating opportunities for Torontonians of all ages, incomes, and abilities, as well as businesses of all sizes.



Strategy 1

Accelerating Development

Unlock the waterfront through infrastructure investments

Sidewalk Labs’ holistic planning approach prioritizes (and provides optional financing for) accelerated delivery of district-scale infrastructure systems, setting the necessary foundation to support widespread development by a range of players and providing critical connectivity to and from the city’s existing economic centres.

Waterfront Toronto and all three levels of Canadian government have taken major steps towards reconnecting Torontonians to the waterfront and realizing its immense economic potential. The largest recent example is the \$1.25 billion Don Mouth Naturalization and Port Lands Flood Protection Project announced in 2017.⁶ Yet this commitment is only one component of the infrastructure necessary to truly capture the enormous potential of the eastern waterfront.

Sidewalk Labs estimates that the additional utility, energy, and public transit infrastructure needed to enable development of the IDEA District could total upwards of \$3 billion, with these costs reaching upwards of \$4.5 billion across the entire eastern waterfront.⁷ One standard approach to securing this infrastructure is to collect necessary funds through charges levied on developments immediately before they begin

construction. But this process could lead to piecemeal infrastructure expansion and create doubts around the timely construction of core infrastructure, especially the light rail extension.

Accelerating delivery of these infrastructure systems, particularly public transit, would likely have an outsized effect on the pace of economic growth. The benefits of early investments in core infrastructure have been found in cities around the world, from Washington, D.C., to Rotterdam. The stakes in Toronto are just as high. According to a 2019 report prepared for the Waterfront Business Improvement Area (BIA) organization by the engineering and development consultancy Hatch, a delay in light rail development until 2045 would result in over \$20 billion in forgone cumulative tax revenue across all three levels of government and cost more than \$1.8 billion in lost productivity.⁸

Between 2004 and 2016, jobs along the Capitol Riverfront’s new metro corridor grew by 94 percent. Credit: Geoff Alexander



(Centre) Since a public transit investment, Kop van Zuid has become one of the densest areas in the Netherlands, known for its economic connections. Credit: Rene Mensen

(Right) Following investment in new transit infrastructure, London’s Canary Wharf was able to realize its potential as a core business centre. Credit: Nikada

The importance of early investment in public transit

Making large infrastructure investments in public transit is a crucial first step in accelerating development, encouraging more sustainable mobility choices, and creating more affordable communities. Transit provides essential access to growing urban districts and enables cities to realize the economic potential of newly developed areas on a far earlier timeline.

As mentioned on Page 108 of Volume 1 and described in greater detail in the “Mobility” chapter of Volume 2, Sidewalk Labs proposes that the public sector pursue a self-financing approach to transit expansion within the IDEA District *before* development begins in this area.

This approach draws inspiration from several precedents.

1. Capitol Riverfront (Washington, D.C.).

The Capitol Riverfront in Washington, D.C., is one of the city’s most vibrant areas today, but for years it was inactive and underutilized. To redevelop this former industrial area, the city made an early investment in transit infrastructure, creating two new metro stops in the district that expanded subway service and connected the riverfront directly to the city centre. Like the planned extension of the light rail, the D.C. riverfront’s new line connected to the city’s primary train station, with access to regional and national rail lines.

The results of this investment were significant. Early provision of transit facilitated the relocation of critical anchor tenants, which in turn attracted jobs and activity to the district, fuelling additional growth and development over time. The Capitol Riverfront metro stops were completed in 1991⁹; between 2004 and 2016, jobs along the corridor grew to 76,000, representing a 94 percent increase.¹⁰

2. Kop van Zuid (Rotterdam).

In Rotterdam, initial efforts to develop the Kop van Zuid historic docklands initially stalled due to the lack of transit infrastructure and connectivity to the rest of the city.¹¹ Recognizing that private developers were unwilling to invest in the area for these reasons, the central government, the public sector Rotterdam City Development Corporation, and the Rotterdam Transport Company funded¹² the district’s first large-scale project: construction of the Erasmus Bridge, with vehicle, pedestrian, and rail access.¹³

Today, Kop van Zuid is one of the densest areas in the Netherlands and is known for the physical, social, and economic connections it has fostered between North and South Rotterdam. For example, South Rotterdam, which was previously disconnected from the economic city centre, now sits adjacent to a strong commercial district with direct access to the rest of the city via the Erasmus Bridge.¹⁴

3. Canary Wharf (London).

As described in more detail in the “Mobility” chapter of Volume 2, the risks of developing an area without robust public transit connection in place include the potential to stifle growth or become locked into expensive road infrastructure that generates traffic congestion.

Take Canary Wharf in London, where the lack of transit connectivity was one of several factors that initially crippled efforts to redevelop the city’s deteriorating docklands in the early 1990s.¹⁵ Without a reliable transit system, the area struggled to attract a critical mass of businesses. Following investment in new transit infrastructure, which connected the area to the rest of London, Canary Wharf was able to become a more active, diverse urban neighbourhood and realize its potential as a core business centre.

Supplementing finite resources to expand light rail

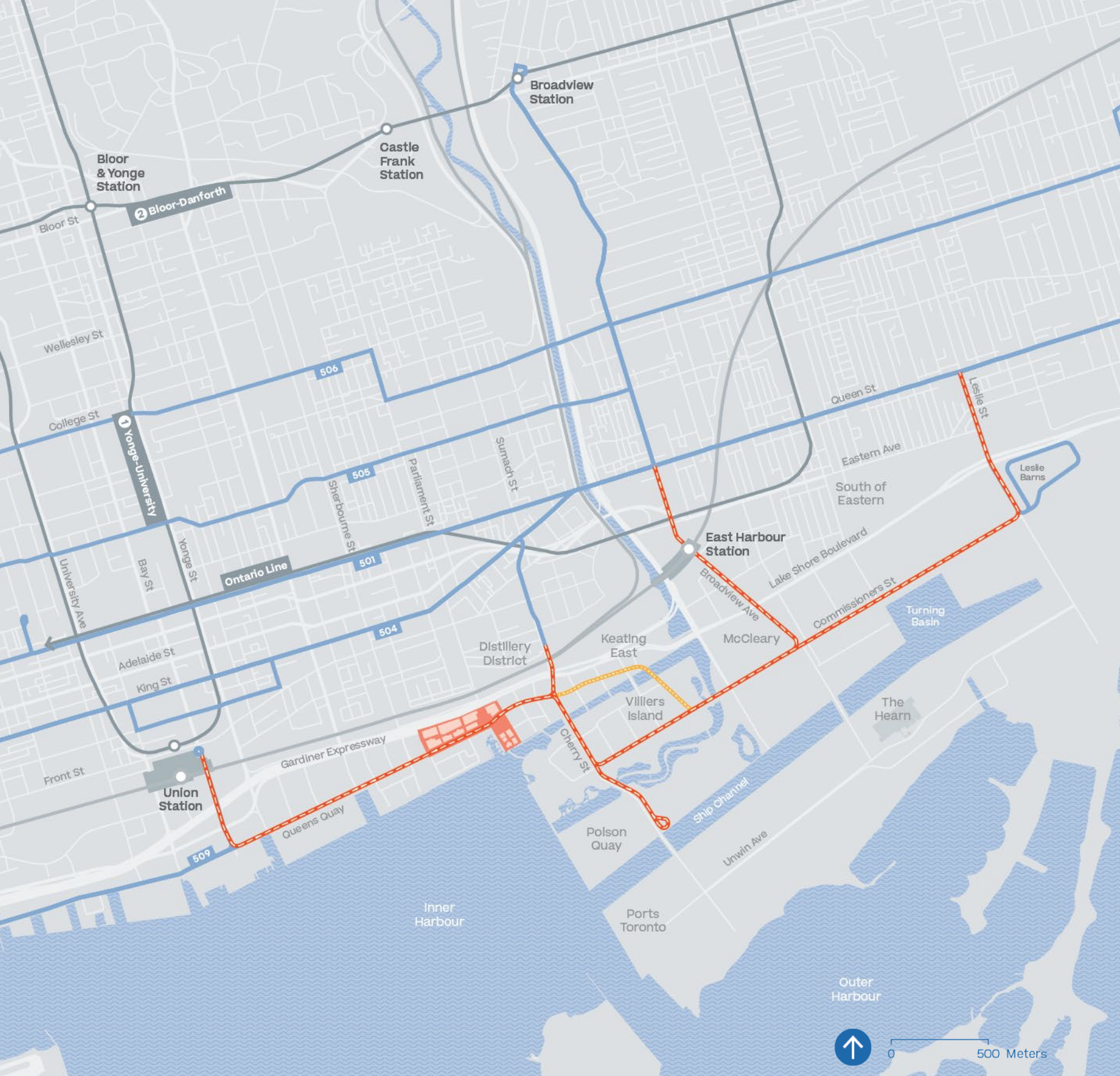
In Toronto, the importance of a connection between the downtown core of Toronto and the eastern waterfront has long been recognized by public and private stakeholders. Numerous municipal planning documents, including Toronto’s 15-Year Rapid Transit Network Plan and the City of Toronto’s Official Plan, as well as industry analysis such as the Waterfront BIA report, all affirm the potential benefit of such an extension by opening up the waterfront for residents and businesses.

Funding for projects of this magnitude can be difficult given the many competing needs of thriving cities. The Toronto Transit Commission (TTC) alone has identified nearly \$24 billion in existing transit needs over the next 10-year planning period¹⁶ (including the Line 2 East Extension, formerly the Scarborough Subway Extension, the Ontario Line, Eglinton East LRT, Sheppard East LRT, and SmartTrack commuter-rail line transformation), \$17.5 billion of which does not have designated funding. Furthermore, city officials often need to prioritize funding for projects that serve an immediate need for existing constituencies over those that supplement long-term development plans, especially in underdeveloped areas.

Sidewalk Labs’ proposal to support early financing of the light rail extension provides an alternate option for the city to relieve funding pressures and enable the delivery of the system on an expedited time frame.

Sidewalk Labs endorses a \$1.2 billion, 6.5-kilometre light rail extension that would realize the city’s existing plans and position the eastern waterfront for future development. To help accelerate the implementation of this extension, Sidewalk Labs commits to providing financing, which could facilitate the delivery of a significant portion of the system years sooner than currently projected in the TTC 2018 Corporate Plan.¹⁷

In addition to providing critical connectivity to Union Station, Quayside, the planned East Harbour transit centre, the West Don Lands, the Distillery District, and neighbourhoods to the east, the expanded light rail would become the transit spine connecting economic hubs across the eastern waterfront.¹⁸ Sidewalk Labs envisions the light rail linking a new economic hub, anchored by Google, at Villiers West, with a film and media cluster concentrated within the Film District and McCleary District, and the GO train and future subway transit hub and commercial core at East Harbour. Mobility across these hubs would contribute to the vitality of each area, allowing convenient and affordable access for residents, workers, and visitors.



Map
A \$1.2 billion plan to extend light rail along the waterfront

GO Transit / SmartTrack
Subway (existing and planned)
Existing
Approved extension
Optional
Quayside

Light rail

Beyond increasing access, early provision of the light rail extension has the potential to encourage more sustainable choices among travellers. When transit is introduced earlier in an area’s development, residents and visitors are more likely to develop commute and travel patterns that prioritize public transit over the use of private car trips, creating a virtuous cycle in which future development also prioritizes more sustainable mobility

infrastructure over parking lots or wide streets designed primarily for vehicle trips. The aforementioned Waterfront BIA report estimates that the extension of the light rail has the potential to prompt a significant mode-share shift — resulting in a 44 percent decrease in automobile use¹⁹ and a 15 percent increase in public transit usership (by incoming workers and residents).

At full buildout of the light rail extension, Sidewalk Labs estimates that it could support roughly 72,900 daily trips.

Sidewalk Labs anticipates the light rail extension would link to the city’s expansive existing network, including connections to multiple citywide routes that carry over 250,000 passengers daily.²⁰ At full buildout of the light rail extension, Sidewalk Labs estimates that it could support roughly 72,900 daily trips and reduce car trips by 16.5 percentage points.

Enabling holistic planning and long-term sustainability

Early delivery of the light rail extension would also make investments in other district-scale infrastructure more viable, enabling the City of Toronto and Waterfront Toronto to undertake a holistic approach to planning for development, rather than funding piecemeal solutions that may result in only incremental improvements. A comprehensive approach at a district scale would enable the integration of innovative systems such as a thermal and power grid to support energy efficiency, dynamic street networks, and greener energy and stormwater management systems that support the city’s critical sustainability goals and Waterfront Toronto’s climate-positive ambitions.

A transit-first approach designed to enable the development of dense, walkable neighbourhoods has the added impact of allowing for more complete communities, connecting a broader diversity of residents and visitors to new jobs and areas of economic activity.

Hong Kong provides a particularly relevant precedent for using a self-financing or value capture model to support the growth of complete communities. The city undertook a strategy of proactively focusing growth in areas close to the city’s Mass Transit Railway system,²¹ drawing private investment for new revenue sources enabled through the transit system, including publicly owned spaces adjacent to the transit system, the sale of air rights above rail stations, and retail and advertising within stations. With access to these new revenue streams, Hong Kong was able to invest back into its transit system as well as in new community benefits, which included the potential for over 600,000 new public housing units.²²

Similarly, on the far west side of Manhattan, ongoing development of one of the city’s last remaining underdeveloped areas was enabled in large part through an extension of the city’s No. 7 train line. The new transit infrastructure, completed in 2015,²³ created a vital lifeline between the west side of Manhattan and the rest of the city, drawing additional investment and encouraging businesses to relocate and contribute to a new centre of activity. The city’s use of a value capture model is expected to produce more than \$21 billion USD in net revenue by 2047, according to a 2019 analysis.²⁴



Strategy 2

Accelerating Development

Anchor waterfront growth with a new Google campus

Relocating Google’s Canadian headquarters and surrounding it with a new public campus could draw talent and innovators from around the world and amplify the waterfront’s economic potential.



A new Google Canadian headquarters in Villiers West has the potential to serve as a catalyst of economic growth, drawing businesses of all sizes and a diverse workforce for existing and new types of jobs.

To further accelerate the development of a new hub for economic activity and innovation, Alphabet commits to establishing a new Canadian headquarters for Google on the western edge of Villiers Island, as part of an agreed-upon transaction within the IDEA District. Alphabet would target up to 500,000 square feet, which would be sufficient to accommodate as

many as 2,500 jobs, the majority of which would be for Google employees (though actual hiring will depend on market conditions and business requirements).

Based on its impact in other neighbourhoods in cities around the world, described more on Page 441, Google’s arrival on the waterfront has the potential



A view of the western edge of the innovation campus (looking west towards downtown).

to catalyze economic growth, attracting firms of all sizes and a diverse workforce, while contributing to the growth of Toronto’s existing innovation ecosystem.

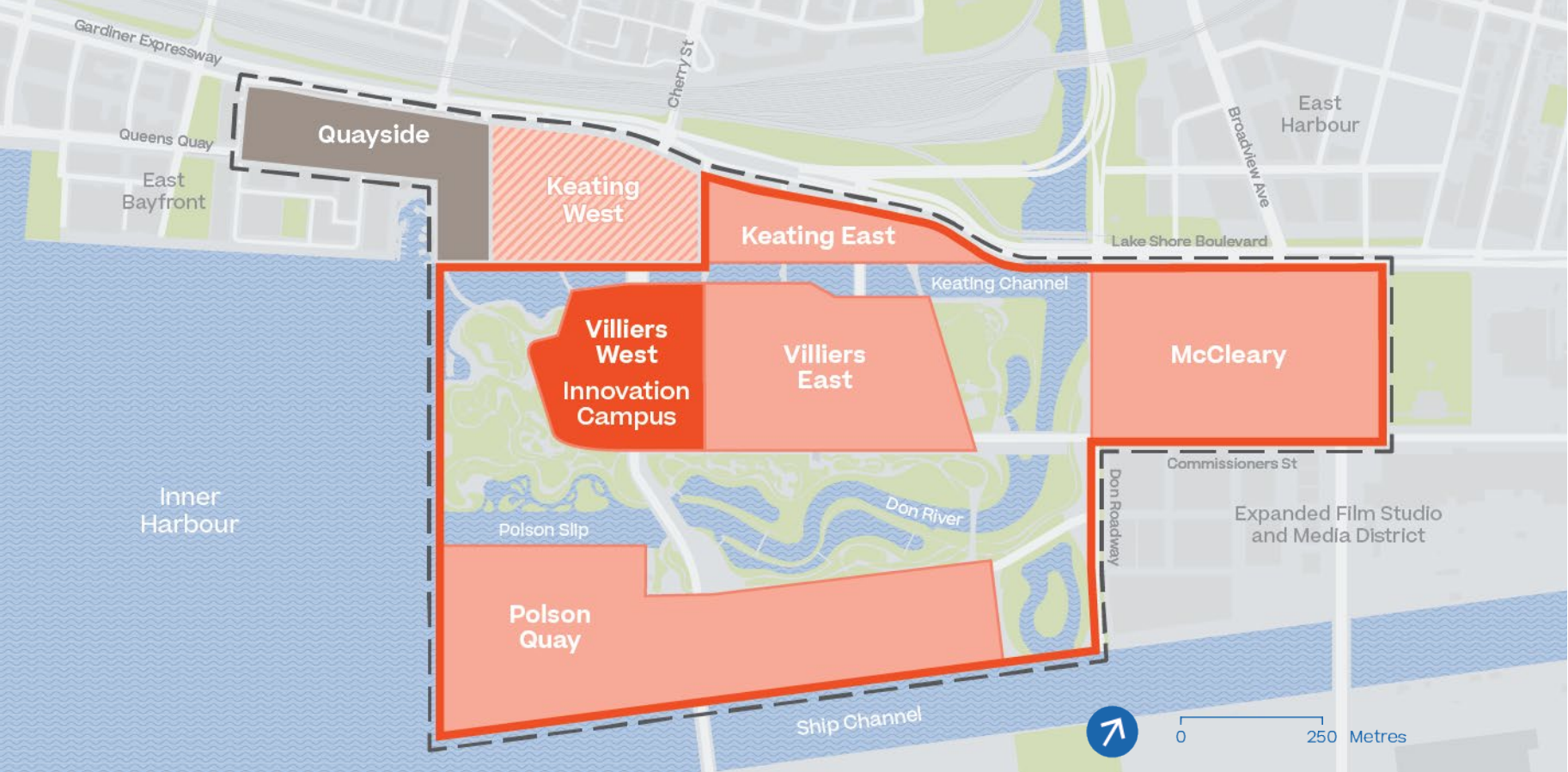
Establishment of large-scale Google campuses in other cities has consistently demonstrated significant impacts in the local real estate market,²⁵ such as strengthening demand for Class A office space, increasing private-sector activity and investment, and driving retail and residential growth that far outpaces the rest of the city.

In many cases, Google’s arrival has prompted the rapid development of local micro-markets, validating the competitive position of specific neighbourhoods within a city and generating an influx of activity. Critically, Sidewalk Labs’ approach prioritizes equitable access to economic prosperity and opportunity, ensuring Google’s presence at Villiers West spurs inclusive growth and is realized by a broad diversity of Torontonians, as described in greater detail on Page 462.

An innovation campus to catalyze an ecosystem

Sidewalk Labs’ proposal for an innovation campus on Villiers Island includes approximately 2.7 million square feet of mixed-use development, anchored by the future home of the Urban Innovation Institute and Google office space. The campus would be located on a planned light rail stop and adjacent to the seven-hectare Promontory Park. In this location, the campus would serve as an important connector between the city’s downtown core and the rest of the eastern waterfront.

The urban innovation campus on Villiers Island would be specifically designed as a campus featuring residential spaces integrated with non-residential spaces for business, cultural, retail, and community uses. The Google Canadian headquarters itself would include select areas dedicated as Google workspaces, as well as more flexible spaces to support a range of community uses, with the flexibility to change over time.



Map The proposed innovation campus within the broader IDEA District

The campus for urban innovation envisioned by Sidewalk Labs would be central to the development of Villiers West, creating a bridge between Quayside and the River District and sparking a new network of neighbourhoods.

- IDEA District
- River District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2

By creating such a campus at Villiers Island, filled with a range of businesses and neighbourhood amenities, Google would help attract a deep talent pool of workers and a range of best-in-class employers, establishing the neighbourhood as one of Canada’s premier business and innovation districts. A range of commercial, retail, and community spaces of all sizes would enable businesses large and small to locate within this new economic centre, ensuring that the eastern waterfront is open for business to a broad range of players.

Google’s reputation as a leader in innovation is well known: a recent survey of executives at various technology firms²⁶

ranked Google as the top leader in “driving technology innovation,” above Apple, Microsoft, Tesla, Alibaba, and Amazon. At the neighbourhood level, Google’s campus model, designed to encourage collaboration and knowledge-sharing, has positioned its offices as local hubs for innovation. For example, in Pittsburgh, Google is the largest tenant at Bakery Square,²⁷ operating alongside departments from Carnegie Mellon University. The co-location of these and other players has fuelled cross-disciplinary collaboration: Google operates a 24-hour shuttle between its offices and CMU,²⁸ and Google staff participate in student thesis committees. Further, Google’s arrival resulted in a rise in commercial growth as

Strategy 2

More than
8,000

jobs were added in Kitchener-Waterloo’s tech sector from 2011 to 2016.

well as in startup incubator, accelerator, and co-working spaces; it has also drawn further investment from other major companies throughout the area.²⁹

In addition to driving the development of an ecosystem for innovation along the eastern waterfront, the establishment of a larger Google Canadian headquarters on Villiers Island has the potential to strengthen the emerging innovation corridor between Toronto and Kitchener-Waterloo and support the growth of both locations.

Located 110 kilometres west of Toronto, Kitchener-Waterloo is home to a rapidly growing hub for technology,³⁰ including Google’s largest engineering office in Canada.³¹ More than 8,000 jobs were added in Kitchener-Waterloo’s tech sector from 2011 to 2016,³² representing the highest growth rate among Canada’s top 10 metropolitan areas. The development of a parallel node of activity in the eastern waterfront enables further opportunities for attracting talent at both locations while reinforcing the region’s leadership on a global stage. The proposed East Harbour Transit hub would provide a public transit connection between Kitchener-Waterloo and the IDEA District.

While Sidewalk Labs believes that the unique innovations planned for Quayside will draw new residents, workers, and visitors, the role of Google as an anchor tenant has the potential to significantly build on this momentum. As described by economist Enrico Moretti,³³ the presence of anchor corporations like Google have

driven growth of new economic and innovation economies to a greater degree than government initiatives alone. This trend has been demonstrated across a range of innovation clusters in North America, including Kansas City, Boston, San Diego, Seattle, and Vancouver, and has the potential for replication in Toronto as well.

The catalytic impact of a large Google presence

Once a critical mass of employees has been reached, Google’s impact on local job and real estate markets has been found to support a city’s competitive position as an economic engine.

To estimate the potential impact of Google’s relocation to the waterfront, Sidewalk Labs conducted extensive research on the impact of Google in cities around the world, focusing on New York, Los Angeles, Chicago, and Austin, Texas, each of which has between 1,000 and 10,000 Google employees, a range that indicated the impact of the proposed new campus. Across these cities, Google’s entrance correlated with characteristics of growth within the local district, above and beyond that of the rest of the city. Compared to the years prior to Google’s arrival, each of the districts studied exhibited an increase in office value in the five years following Google’s occupancy, as well as an uptick in the retail and residential inventory of the area.

Sidewalk Labs believes the establishment of a larger Google campus on the eastern

Google NY by the numbers:
→ Over 7,000 employees in nearly two decades
→ A 10% post-Google increase in commercial inventory in the Meatpacking District
→ A 3.3% average quarterly growth in office value in the district

waterfront could catalyze growth similar to that demonstrated in each of these markets — and particularly to that of New York City and Chicago.

Google New York.

In New York City, Google has grown to over 7,000 employees in nearly two decades,³⁴ helping to transform the western edge of Manhattan into a major economic hub that rivals Midtown and the Financial District.

The growth of big tech companies like Google has demonstrated potential to catalyze small business formation, create buyers for the products that startups produce, and encourage skilled workers to apply for tech-related jobs in non-tech industries. Academic research suggests that a high concentration of tech employment can improve wages for a wide range of jobs,³⁵ including those that do not require a degree. More broadly, the growth of tech jobs is associated with an increase in the overall number of non-tech jobs, amounting to approximately five new non-tech jobs for every new tech job created.

Google's growth in New York City has impacted the commercial interest of surrounding areas as well, validating the competitive position of the Meatpacking District as a core hub of economic activity. In the five years following the arrival of Google, the Meatpacking District experienced a more than 10 percent increase in commercial inventory, and the broader geography of Chelsea (which includes the Meatpacking District) experienced a 30 percent increase. This growth is especially significant in light of the overall stagnation of office inventory in Midtown Manhattan over the same time period.

Further, the value of office space in the Meatpacking District has almost tripled following Google's arrival, again far outpacing that of Midtown Manhattan, which did not demonstrate any meaningful growth over the same time period. While both Chelsea and the Meatpacking District experienced declining office value rates in years prior to Google's arrival, the post-Google years reversed this trend, resulting in 3.3 percent average quarterly growth in the Meatpacking District and 1.7 percent average quarterly growth in Chelsea. Growing demand in these areas has, in turn, changed the character of retail in the area, resulting in more restaurants and amenities available within walking distance for a growing workforce, for residents, and for visitors to the neighbourhood. The new office space drove broader impact throughout the city as well, including by catalyzing the development of lower-cost commercial districts in New York City's outer boroughs, particularly Brooklyn and Queens.

Google Chicago.

In Chicago, the Fulton Market neighbourhood, located west of the city's downtown core, was announced as the home to Google's midwestern headquarters in 2013,³⁶ ultimately opening in 2015.³⁷ Prior to Google's entrance, the area was largely home to food processors and distributors. Despite the area's proximity to major expressways and the downtown core, the historically industrial area struggled to draw sustained commercial interest. Google's arrival at Fulton Market represented the first move of a large-scale commercial entity, repurposing an existing windowless and formerly industrial warehouse into an office for hundreds of employees.

Google Chicago by the numbers:
→ 100% post-Google increase in office inventory
→ 5.7% average quarterly increase in office space value
→ 400% growth in multifamily unit inventory

Today, more than five years after Google announced its move, the Fulton Market area is home to robust a new neighbourhood and business district. New restaurants and retail and lifestyle shops have drawn visitors to the area at a rate that has not been seen in the past. Campus spaces that host a range of creative uses function as a magnet for talent and attract employers seeking to source local workers. Fulton Market is now one of the most in-demand areas for growth and relocation.³⁸

Google's arrival at Fulton Market has also led to an increase in office inventory of more than 100 percent, compared to only 19 percent growth throughout the West Loop in the same time period. The value of Fulton Market's office spaces has increased as well — at a rate of 5.7 percent on average quarterly, compared to a rate of 0.9 percent prior to Google's arrival. In addition to expanded commercial space, the Fulton Market area has experienced nearly 400 percent growth in the inventory of multifamily units, compared to an increase of 39 percent in the West Loop over the same time period.

Growth in commercial space over a five-year period after Google's entrance

An analysis of four U.S. cities found that commercial assets increased in micro-market office value in the five years following Google's opening of an office space, above and beyond the growth exhibited in each city's central business district.

	Central Business District growth post Google entry	Micro-market growth post Google entry
City		
New York City (Chelsea, 2005-2010)	-0.1%	30.6%
Chicago (Fulton Market, 2013-2018)	19.0%	108.0%
Austin (Shoal Creek, 2015-2018)*	23.6%	64.4%
Los Angeles (Playa Vista, 2012-2017)	0.0%	21.8%

* Due to Google's presence within Austin beginning in 2015, commercial inventory analysis for this location is based on a three-year period rather than a five-year period.



Strategy 3

Accelerating Development

Attract talent and jobs with complete communities

An approach to planning that emphasizes a vibrant mix of homes, offices, shops, and community spaces — initiated in Quayside and expanded across Villiers West — could welcome significant economic opportunity for businesses large and small.

The benefits of compact, walkable, mixed-use neighbourhoods designed for residents are now well-established, including improved public health, a stronger sense of community, reduced pollution, and a greater range of housing and transportation options.

Sidewalk Labs' proposed plans for Quayside and Villiers West, and its larger vision for the IDEA District, would advance existing strategies for creating dense urban neighbourhoods activated by a vibrant streetscape, including through an expanded public realm that draws people outdoors, a street network that prioritizes pedestrians and public transit, adaptable building spaces that accelerate renovations, and a new approach to programming ground floors that expands opportunities for small businesses and community spaces.

This new type of complete community with quality-of-life benefits would be attractive to entrepreneurs and companies of all sizes and establish the eastern waterfront as a magnet for top talent and new jobs while preserving and promoting socioeconomic diversity.

Mixed-use neighbourhoods as a backdrop for economic opportunity

Twenty years ago, many experts claimed that the rise of email, video-conferencing, and other low-cost digital communications would eliminate the need for workers to meet face-to-face — and, by extension, the competitive advantage of cities. Today, it is clear that the opposite is true. In a knowledge economy increasingly driven by new ideas, the networking effects of urban density are more important than ever. A clear bellwether of this trend is the steady demise of the isolated



The revitalization of the formerly industrial “Two Kings” area has helped establish Toronto as a global leader in mixed-use development.
Credit: David Pike

suburban office park and the global ascent of mixed-use neighbourhoods in the heart of urban centres.

Cultural, generational, and market changes in urban areas are happening faster than ever before, and cities need to be prepared to be more flexible and responsive to these shifting dynamics. Mixed-use environments provide the necessary integration of resources for talent and companies of all sizes to thrive, serving as a backdrop for the innovation economy.

Throughout Toronto, the reimagination and reinvestment in several older central areas of the city — including Liberty Village, Corktown, and the Distillery District — has resulted in a set of dynamic business districts that contribute to the vitality of

their surrounding neighbourhoods and to the city at large. Each of these areas has attracted leading-edge companies and cultural enterprises, paving the way for new economic opportunity.

Perhaps the best-known examples are at King-Spadina and King-Parliament — the “Two Kings.” There, formerly industrial buildings underwent redevelopment efforts in the mid-1990s to spur the renewal of the surrounding area, which at the time was underdeveloped and largely comprised of surface parking lots. Redevelopment of the two areas was enabled through what was innovative regulation at the time — a zoning bylaw, implemented in 1997,³⁹ that eliminated antiquated land-use policy restrictions and allowed for a new mixed-use development approach.

The success of these districts is widely lauded in Toronto and beyond and has helped establish Toronto as a global leader in mixed-use planning. Revitalization of the Two Kings has allowed for more than 50,000 new residential units.⁴⁰ And while job growth in Toronto increased by 20 percent citywide between 1996 and 2016, job growth in King-Spadina and King-Parliament far outpaced this trend, increasing by nearly 70 percent and 30 percent, respectively. In the two decades since redevelopment efforts were completed, more than 20,000 net new jobs have been created in these districts, nearly 30 percent of which are in the cultural, creative, and tech sectors.

The transition of the Two Kings into thriving mixed-use areas was enabled in large part through the expansion of land uses, which in turn allowed for the entry of larger waves of tenants and businesses. Each new entrant was able to take advantage of the historic spaces in ways that the original architects and city planners never conceived, but given the flexible design, these spaces were able to be repurposed for a range of new uses.

Examples like Two Kings demonstrate how the nature of urban experiences in mixed-use districts represents a marked difference from traditional economic centres, with the capacity to draw new talent and companies, facilitating more diverse economic activity in cities.

Advancing mixed-use plans with innovation to create a new type of place

Sidewalk Labs’ vision for the IDEA District builds on existing best practices for mixed-use planning by integrating a suite of innovations designed to draw more people outdoors, encourage more active transportation choices, help buildings respond to market conditions, and create a livelier mix of homes, offices, shops, social infrastructure, and community uses. The large-scale application of this approach would create a truly dynamic live-work community in which households and businesses of all sizes can find the spaces they need to thrive.

An expanded public realm that draws people outdoors.

Residents and workers in the IDEA District would benefit from open spaces and sidewalks made comfortable at least 35 percent more of the year thanks to a set of weather-mitigation tools — deployed in real time based on micro-climate data — that provide shade from the sun and shelter from the elements. Open spaces and sidewalks would be integrated closely with the surrounding stoa space, creating the foot traffic and vibrant street life ground-floor retailers depend on.

A street network that prioritizes pedestrians and public transit.

To further encourage active sidewalk life, the IDEA District would feature a street network designed to expand pedestrian space by up to 91 percent compared with business-as-usual development, enabled by transit, walking, cycling, and



All proposed digital innovations would require approval from the independent Urban Data Trust, described more in the “Digital Innovation” chapter of Volume 2.

new mobility options (and, eventually, self-driving vehicles) that reduce the need for vehicle space. This improved walkability and public transit access form the foundation of a complete community that puts homes near work and residents near essential daily services.

Adaptable building spaces that accelerate renovations.

Adaptable “Loft” spaces designed to accommodate both residential and non-residential uses can ensure an ongoing mix of households and businesses while reducing vacancy time. Loft’s flexible interior wall system enables renovations to occur 50 percent faster than in traditional building spaces, ensuring that neighbourhoods can respond to changing market conditions.

A new approach to programming ground floors that expands opportunities.

Adaptable stoa space on the lower two floors of buildings in the IDEA District are designed to accommodate a wide range of retailers, pop-up shops, civic groups, and maker spaces. A digital leasing platform enables these spaces to be leased at a variety of sizes big or small and at lease lengths short or long, as needed, expanding opportunities for small businesses and startup ventures.

A range of housing options that improve affordability.

In addition to a 40 percent below-market housing program (described more on Page 463), efficient unit designs can expand housing options for single-person and multi-generational households alike, enabled by advances including access to off-site storage space with on-demand shipping.

A network of social infrastructure to anchor complete communities.

Ensuring a strong network of social infrastructure, including access to health care and community services, is critical to meeting Waterfront Toronto’s objectives for designing complete communities. The city has also noted the need to ensure that appropriate, affordable, and accessible space is available for the delivery of services; to proactively plan for health care service delivery alongside community services and facilities planning; and to co-locate services in central hubs to enhance coordination and resource sharing. In fact, all levels of government have recognized the need for enhanced integration of services.

The IDEA District innovations would create a truly dynamic live-work community in which households and businesses of all sizes can thrive.



Strategy 4

Accelerating Development

Support new and existing industries with an “expanded downtown”

The network of neighbourhoods that emerge from Quayside and Villiers West would connect three anchors of economic activity: the innovation campus on Villiers West, a hub of new office space at East Harbour, and Toronto’s Film District.

Waterfront Toronto and the City of Toronto have played a leading role in sparking new business activity and the development of new communities along the waterfront. Partnerships with the development community in recent projects at East Bayfront, the West Don Lands, Corus Entertainment, George Brown College, and Menkes Developments’ Waterfront Innovation Centre set the stage for a significant concentration of employment extending into the developments of Quayside and the innovation campus on Villiers West.⁴¹

When combined with two other major economic drivers — First Gulf’s East Harbour project, which will provide necessary expansion relief for the downtown office market,⁴² and the current and future activity within the Film District and Media City⁴³ — the volume and diversity of economic activity would transform the eastern waterfront into a second commercial core for Toronto.

Embracing the film industry on the eastern waterfront

Toronto is home to a thriving cluster of film-related industries that have helped to establish the city as a global film and television production leader and to boost tourism, including through the promotion of renowned events like the Toronto International Film Festival. Much of the industry’s resources are concentrated on the waterfront, including production, distribution, exhibition, post-production, and radio and television broadcasting functions.⁴⁴ The film industry has broad economic impact and is a critical economic driver for Toronto: in 2016 it contributed more than \$2 billion, and each year it has been responsible for approximately 40,000 jobs.⁴⁵

The industry’s growth is now quickly outpacing capacity. Without sufficient studio space to meet local and international

production demands, Toronto’s studios have been forced to turn away multiple projects each year. Other jurisdictions throughout Canada and the U.S. are increasingly bidding for and winning larger pieces of the production pie thanks to some structural advantages over Toronto, such as milder weather and larger production spaces. The value of projects turned away due to lack of studio space cost Ontario potential revenue of \$130 million in 2016 alone,⁴⁶ with the potential for greater impact in years to come.

Sidewalk Labs supports the film industry and recognizes the value of dedicating the lands within the Film District and Media City exclusively for film-related uses. This area has deliberately not been included in the geographic boundaries of Sidewalk Labs’ proposed IDEA District. Sidewalk Labs also recognizes that film expansion projects could occur within the boundaries of the proposed IDEA District, such as the McCleary District, and is committed to supporting the inclusion of such projects within precinct plans and other such actions undertaken by Waterfront Toronto or the City of Toronto.

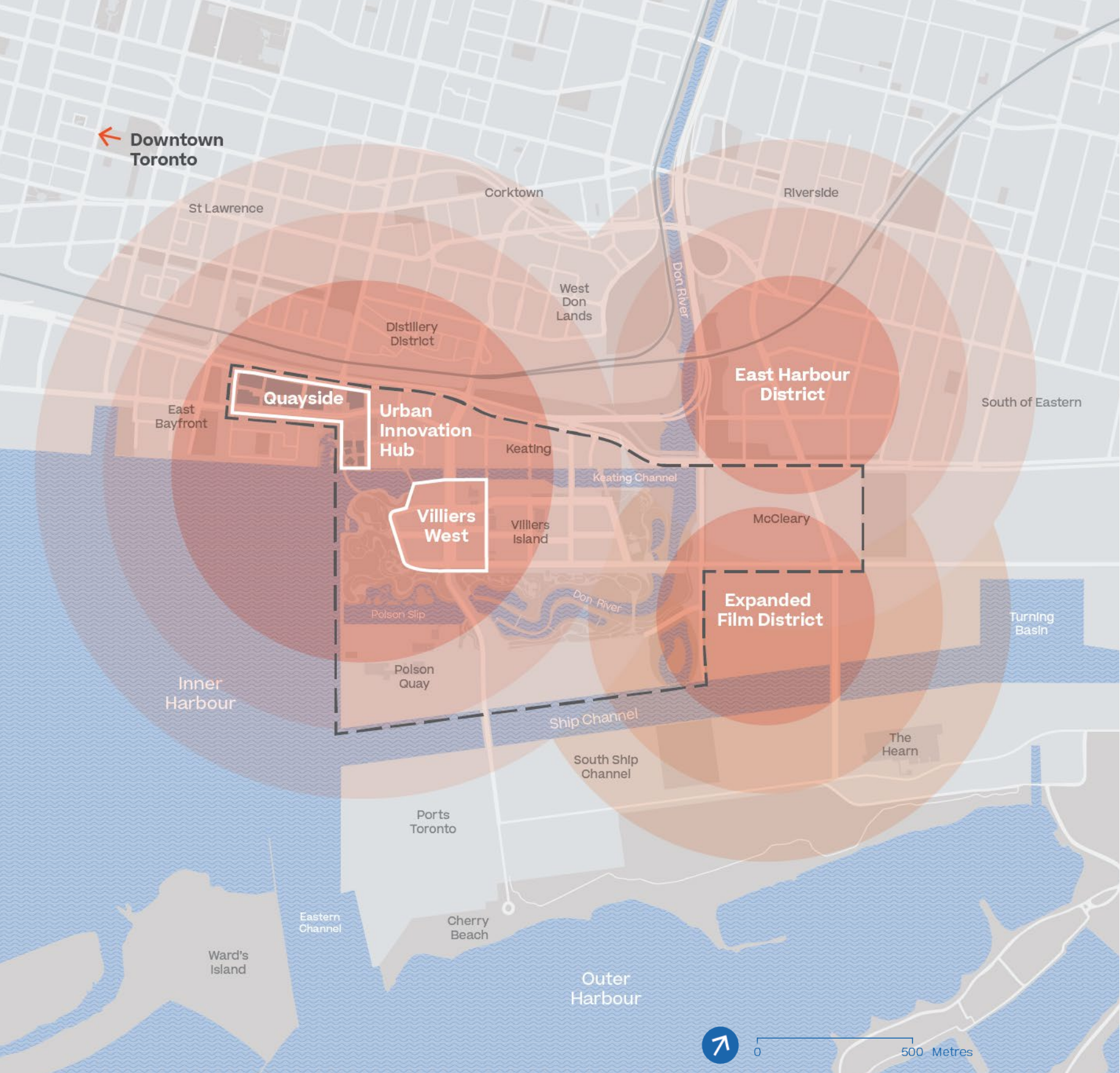
Sidewalk Labs also believes that the aspirations for the IDEA District, the development plans for Quayside and Villiers West, the acceleration of the infrastructure, and the creation of vibrant mixed-use neighbourhoods would boost film industry growth.

The growth of the urban innovation ecosystem along the waterfront can create opportunities for the film industry to participate in and benefit from the physical, digital, and policy innovations unfolding in its backyard. Proximity to mixed-use, affordable neighbourhoods

can result in housing opportunities for film industry employees, help attract talent, and create a vibrant environment around the studios. Transit connections, such as the Waterfront LRT expansion, with a stop at the border of the existing film district, would connect the studios to both Union Station and the planned East Harbour transit hub, greatly facilitating access between the facilities and the rest of the city.

Sidewalk Labs has identified specific opportunities to collaborate directly with the film industry and hopes to explore them as the Sidewalk Toronto project advances. This effort includes the integration of film-supportive design into its plans for the public realm, streets, and buildings in Quayside and Villiers West. For example, access to power sources and internet connectivity within the public realm — provided as part of Sidewalk Labs’ proposals for open space infrastructure and digital innovation — could present new, cost-effective opportunities to support film shoots.

Additionally, film is a technology-driven industry, and Sidewalk Labs believes that opportunities should be explored for the film industry to participate in the ecosystem for urban innovation envisioned at Villiers West. For example, post-production departments could collaborate with graphic design startups to improve film animations or special effects.



Map
Three economic hubs connected by the IDEA District

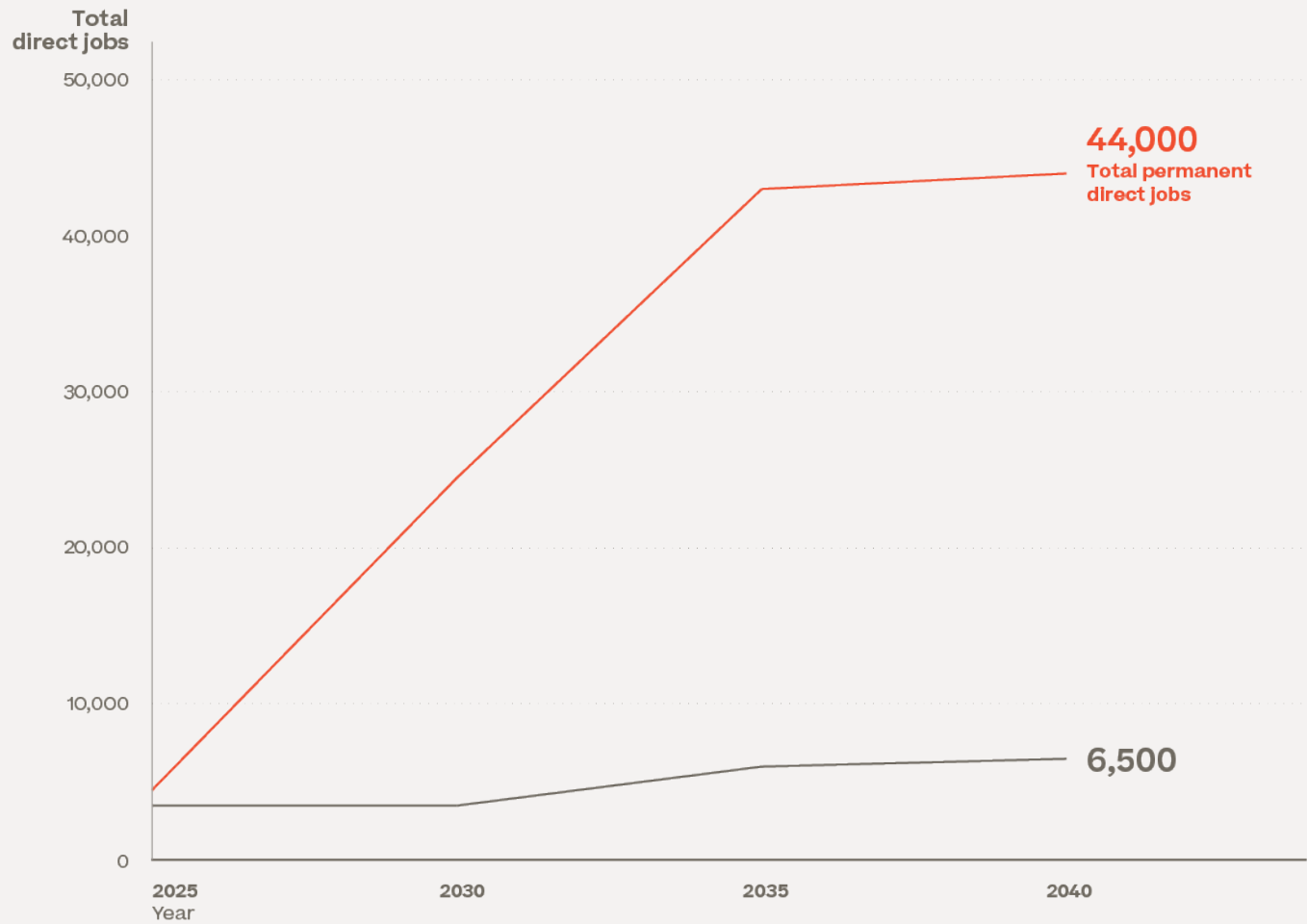
The IDEA District would support three economic hubs that together would transform the eastern waterfront into a second commercial core for Toronto.

----- IDEA District

The IDEA District: Dramatically accelerating job growth by 2040

The urbanMetrics analysis estimates that the IDEA District would stimulate 44,000 full-time direct jobs by 2040. Within the first 10 years alone, the district would be home to more permanent jobs than the total number predicted for the baseline scenario at full completion, which is not projected to occur until 2050.

IDEA District
Baseline scenarios





Strategy 5

Accelerating Development

Plan for prosperity with equity

Sidewalk Labs is committed to not only spurring sustainable economic development throughout the IDEA District but to doing so in a way that is equitable to all, expanding opportunities for those who have traditionally faced barriers to prosperity.

Like all growing cities, Toronto faces challenges around equity, affordability, work stability, and income disparity — issues with disproportionate impacts on marginalized and vulnerable groups. Sidewalk Labs’ program for the IDEA District is built on the premise that urban development and technological innovation must advance prosperity for all, particularly those who have been historically excluded from opportunity.

Residents of high-demand cities across North America are increasingly concerned that the economic growth generated by new technology industries will benefit a select few while creating greater affordability challenges for many. In San Francisco, for example,⁴⁷ the tech boom increased median income but also led to a widening income-inequality gap, and a lack of new or affordable housing has driven low-income households to relocate elsewhere.

Similar fears of pricing out lower- and middle-income households often arise with new mixed-use developments. For all their benefits in terms of transit access, health, and vibrancy, mixed-use developments have also been found to increase housing prices unless there are explicit commitments to affordability. One recently published study found that the decline in affordability in Toronto between 1991 and 2006 was more severe in mixed-use zones than in the rest of the city.⁴⁸

Despite Canada’s global reputation for inclusion, many sectors fall short on diversifying their workforce — and the tech sector is no exception. A 2017 survey of 900 Canadian tech firms found that women occupy just 5 percent of CEO roles and 13 percent of executive positions.⁴⁹ A 2018 study of Toronto’s tech community by MaRS found that nearly two-thirds of black respondents reported experiencing discrimination at their jobs.⁵⁰

To help directly mitigate these consequences, Sidewalk Labs’ approach to driving economic growth starts with an ambitious program for affordable housing and other commitments to diversity, equity, and inclusion. It builds on this foundation with a set of workforce development initiatives designed to help prepare Torontonians for the 21st-century economy.

More broadly, Sidewalk Labs’ vision for growth aims to lower barriers to entry and enable a wide range of innovators to plug into an open platform — with an emphasis on individuals who might not otherwise have access to employment opportunities or the resources to launch a business. Research suggests that clustering industries enhances skills training and non-profit partnerships for employment positions, supporting transitions to higher-skilled jobs. Sidewalk Labs aims to build on this trend by leveraging partnerships with academic institutions, research organizations, and non-profits to support new training and educational opportunities.

By creating the conditions to spur innovation, Sidewalk Labs can enable a range of third parties to discover promising solutions to urban challenges that create brand new career paths for people with a range of backgrounds.

Affordability and accessibility commitments: Anchored by 40% below-market housing

Sidewalk Labs believes that prosperity must not sacrifice equity — and that thoughtful planning can help both coexist. To help ensure that the IDEA District does not become an elite enclave, Sidewalk Labs has committed to a broad plan for diversity, equity, and inclusion (see Page 82) anchored by a housing program that devotes 40 percent of units to below-market housing.

As described in further detail in the “Buildings and Housing” chapter of Volume 2, Sidewalk Labs’ vision for housing devotes 20 percent of units to traditional affordable housing (a quarter of which would go towards households with “deep” affordability needs) as defined by the City of Toronto. Another 20 percent of units would go towards middle-income households that cannot qualify for affordable housing programs but also cannot afford to pay market rates for rentals or homes.

Additionally, half of all housing units in this program would be purpose-built rentals to improve affordability over the longer term. And 40 percent of units would be “family-sized” at two bedrooms or larger.

In addition to expanding housing affordability, Sidewalk Labs aims to improve the “all-in” affordability of living in the neighbourhood. For example, Sidewalk Labs believes its expanded suite of mobility options — including better walking and cycling infrastructure, public transit expansions, and ride-hail services — would enable households to give up car-ownership without sacrificing their ability to get around. Sidewalk Labs

estimates that a two-person household that gives up a car in exchange for a Side-walk Toronto **mobility subscription pack-age would save more than \$4,000 a year.**⁵¹

A complete community must also plan for people of all ages and abilities. To accommodate residents across the lifes-pan, from seniors wishing to age in place to growing families with young children, Sidewalk Labs plans to incorporate **flexible housing types that can expand or shrink with household needs, co-living units that provide greater community support, and a range of social infrastruc-ture services accessible throughout neighbourhoods.** A host of accessibility initiatives would include accessible street features and building entrances for people who use wheelchairs, and new wayfinding tools for people who are visually impaired.

Together these efforts are designed to ensure that the opportunities provided by this economic development plan truly exist for the benefit of everyone — and to demonstrate to cities around the world that prosperity with equity is not just pos-sible but necessary in the digital age.

**Workforce development:
Preparing Torontonians for
the 21st-century economy**

Sidewalk Labs plans to provide workforce development opportunities to ensure the local workforce is equipped with the skills needed to suc-ceed in a 21st-century economy.

The IDEA District should become a place where more women feel empowered to launch startups and scale prototypes; where workers without college degrees can find apprenticeships in new trades such as mass timber, equipping them not only to complete one-off construction jobs but to launch meaningful careers in an emerging field; where graduate students from other countries can move to conduct research at the Urban Inno-vation Institute and find a welcoming, affordable community.

By implementing an economic develop-ment strategy that is designed specifically to improve access to opportunity, the eastern waterfront and Toronto on the whole could fundamentally redefine development practices, setting a higher standard for economic equity and demonstrating tools and programs that can be replicated around the world.

Sidewalk Labs’ economic development strategy has the potential to realize priorities identified by the city, including those articulated in its Official Plan. These include supporting “employment and economic development that meets the objectives of Toronto’s Workforce Development Strategy, including people-based planning and the Vision Statement on Access, Equity and Diversity and promoting infrastructure and support programs to ensure that all Torontonians, particularly equity-seek-ing groups, such as racialized youth, persons with disabilities, single mothers and newcomers, especially refugees, have equitable access to employment

opportunities”; and recognizing “the full diversity of employment activities that are increasingly taking place in non-tradi-tional employment areas such as homes and public spaces, and strengthening the necessary regulatory frameworks and policies to support this employment.”⁵²

Building stronger and more inclusive pathways into both the urban innovation economy and the broader economic opportunities unfolding across the water-front is critical to ensuring that the wealth created here is broadly shared, as well as to meet growing employer demands for a skilled workforce. Getting into the opportunity pipeline early in life is criti-cal for strengthening economic mobility. At the same time, reskilling mid-career workers to shield them from economic disruption is an increasingly urgent chal-lenge. In Ontario, it is estimated that up to 3 million workers could lose their jobs to automation over the next 20 years.⁵³

Increasing worker productivity is also critical in light of Canada’s shifting demo-graphics. In 2016, for the first time in history, seniors over the age of 65 out-numbered children under the age of 14.⁵⁴ This has worrying implications for future productivity and the ability of workers to support an expanding population of seniors. The gig economy is also cause for concern. In 2016, for example, nearly all net new job creation in Canada was for part-time roles, according to TD Eco-nomics.⁵⁵ Developing more permanent, high-quality jobs is essential for promot-ing broad-based social mobility.

Conceived in close concert with local partners, Sidewalk Labs’ workforce strat-egy aims to support Torontonians of all ages and backgrounds so that they are trained to compete, and remain com-petitive in the 21st-century economy. Sidewalk Labs also wants to help employ-ers — from tiny startups to major corpo-rations — fill their talent needs.

This strategy begins by establishing a proposed non-profit entity, Sidewalk Works, to help those who are currently underrepresented in the tech sector prepare for jobs in the new economy. Working closely with qualified partners, Sidewalk Works would curate and influ-ence skills training to meet real-time employer needs, recruit across the city to broaden workforce participation, and provide access points to the urban innovation economy — all supported by cutting-edge digital tools. It would also champion equity in the tech sector by convening employers in the IDEA Dis-trict across industries to identify and address common challenges, build their capacity to support and retain diverse candidates, and drive equity through economic opportunity.

This approach continues by opening paths to the skilled trades. Sidewalk Labs plans to ensure that at least 10 percent of hiring goes to those who need these jobs most, with a focus on low-income youths, women, and Indigenous people.

Sidewalk Labs plans
to ensure that at least

10%

**of hiring is reserved
for low-income
youth, women, and
Indigenous people.**

Contractors would be required to provide opportunities for mentorships, internships, and other work-integrated learning opportunities, as well as to consider qualified candidates from targeted communities first for professional, administrative, and technical positions — an approach known as “first source” hiring.⁵⁶

Finally, this workforce strategy would be complemented by the rise of a world-leading Canadian industry focused on sustainable mass timber building materials and capable of creating thousands of full-time jobs, including higher-paying jobs in carpentry specialties.

These three main strategies would ensure the IDEA District can support work opportunities for all Torontonians.

1

Expanding opportunity with Sidewalk Works.

Once Quayside is up and running, the workforce development program Sidewalk Works would build an inclusive talent pipeline, support on-site employers in filling real-time needs, and create a culture of inclusion in the workplace. It would work closely with local partners, taking advantage of cutting-edge work in sustainability, mobility, buildings, and technology to build on-ramps into the urban innovation economy.

First, Sidewalk Works would focus on growing and training an inclusive talent pipeline through youth engagement, higher education partnerships, digital recruitment tools, training, and work-integrated learning opportunities. It would work closely with local institutions and community agencies to curate a range of training programs — including boot-camps, online courses, and micro-credentials — that blend the best of face-to-face and online learning and are designed to accommodate students with a variety of schedules, skills, and backgrounds. Sidewalk Works would aim to build strong local collaborations that can help support a diverse workforce, including with the Toronto Public Library and George Brown College to offer skills development courses across the city; with Seneca College to train next-generation building managers and operators; with the CEE Centre for Young Black Professionals and the City of Toronto's Partnership to Advance Youth Employment program to support training opportunities in tech for youth; and with agencies such as ACCES Employment, Dixon Hall, and Miziwe Biik Aboriginal Employment and Training to build awareness and opportunities for newcomers, low-income people, and Indigenous people.

Sidewalk Works would also work to connect tenant employers with graduates of an entry-level information-technology (IT) certification course called the Google IT Support Professional Certificate, a program developed by Google and Coursera to help non-traditional candidates begin careers in technology. The course is one

component of “Grow with Google,” an initiative to help Canadians acquire the digital skills needed to get jobs or grow businesses. In Canada, approximately 182,000 jobs need to be filled within the IT field in 2019.⁵⁷ Many of these jobs do not require a four-year college degree but do require skills and industry-relevant experience. While designed to serve the needs of employers on-site, these and similar partnerships would also pay dividends to the broader tech sector in Toronto by diversifying and accelerating the overall talent pipeline.

Second, Sidewalk Works would aim to ensure that employers can meet their talent needs by gathering information about tenant employer needs through data collection and real-time analysis of current skills gaps as well as direct engagement with human resources executives.

Part of Sidewalk Works would be a service called Talent Connect, a “talent concierge” that can provide curated access to top-tier talent and assistance with navigating government-funded services and post-secondary co-op and work placement programs. Talent Connect would be available to all member firms operating in the IDEA District but would likely be of particular value to small firms that may not have dedicated human resources staff.

Third, Sidewalk Works would work to set a standard for inclusive workplaces and economic equity across the waterfront. Diversity does not rely only on training and recruitment alone: building an inclusive workplace requires culture change.

An employer consortium would be created to share best practices, convene events, track key metrics, and build the capacity of employers to lead the way in modelling a culture of inclusion.

For its part, Sidewalk Labs is committing to furthering diversity and inclusion in the tech industry by joining RBC, LinkedIn, AutoDesk, and other industry leaders on MaRS’ Inclusion Council. These firms could also join the Sidewalk Works employer consortium if they locate on the eastern waterfront.

Finally, the programs advanced by Sidewalk Works align with the goals of the Future Skills Centre recently announced by the federal government,⁵⁸ including developing innovative approaches to help Canadians gain emerging skills in demand now and into the future. While still in the early stages of development, the Future Skills Centre will allocate half of its funding to disadvantaged and underrepresented groups (including up to 20 percent for youth), reinforcing the importance of creating inclusive economic opportunities.

2

Broadening the construction workforce.

The Toronto Board of Trade projects that total construction activity in Toronto in the next 12 years will be 43 percent greater than it was over the past 15 years,⁵⁹ with an anticipated 147,000 job openings in 500 construction-related occupations. Development across the full scale of the IDEA District could lead to further shortages in skilled labour, generating ripple effects throughout the regional economy. This demand for labour, combined with a rapidly aging population, creates not just an opportunity but a competitive imperative to build and train Toronto's construction workforce of the future.

In Canada, women account for approximately 13 percent of the construction workforce,⁶⁰ and Indigenous people account for roughly 3 percent. Nation-wide, just 9 percent of workers in the building trades are visible minorities,⁶¹ despite the fact that visible minorities make up roughly 22 percent of the general population.⁶² To help address this imbalance, Sidewalk Labs plans to build on the Waterfront Toronto Employment Initiative, working with Construction Connections (a unique construction-sector workforce development program managed by the city and the province) and Toronto Employment and Social Services, to target at least 10 percent of construction hours for racialized youth, women, and Indigenous people.

Sidewalk Labs also plans to work with other partners in the employment and labour sectors to support training opportunities for women, racialized youth, and Indigenous people; these groups include the College of Carpenters and Allied Trades, Building Up, Dixon Hall, and Miziwe Biik Aboriginal Employment and Training. Sidewalk Labs proposes to require that contractors provide opportunities for mentorships, internships, and other work-integrated learning opportunities and implement a first-source hiring approach for professional, administrative, and technical positions.

3

Catalyzing the mass timber industry.

Canada owns about 37 percent of the world's certified forests, defined by the international Forest Stewardship Council as areas that can be harvested for wood in a sustainable way, with proper spacing to regrow trees and with access to existing railways or roads to transport supplies. Canada is also a world leader when it comes to ensuring innovative and sustainable forestry management practices that safeguard our wood resources for future generations.

But while Canada harvests nearly 800,000 hectares of timber per year, the majority of that supply is devoted to framing lumber, such as simple two-by-fours or plywood. As a result, Canada

Factory-based construction of mass timber building parts could ultimately lead to higher-paying factory jobs for new advanced carpentry work.



currently imports mass timber parts from Austria and other production centres instead of producing them itself.

A new Ontario-based mass timber factory would support 2,500 person-years of full-time employment over 20 years.

In Quayside, Sidewalk Labs intends for the entirety of the planned 2.6 million-square-foot neighbourhood to be built from mass timber, demonstrating beyond previous efforts the viability of this sustainable building material for a variety of uses and forms. The hope is that this proof of concept would spur a more rapid adoption of this material, enabling Canadian industry growth commensurate with its natural resources.

With a commitment for the proposed development scale of the River District, Sidewalk Labs is prepared to catalyze industry growth with an investment to create a new Ontario-based factory for modular mass timber construction. To be opened prior to the construction of Quayside, this factory would ensure the delivery of a mass timber supply chain for building construction along the eastern waterfront and beyond.

Sidewalk Labs believes that the domestic supply of mass timber products produced in such a factory would support an estimated 2,500 person-years of full-time employment over a 20-year period.

The launch of this factory would have additional benefits for local workers. As described more in the “Buildings and Housing” chapter of Volume 2, an enhanced mass timber industry could ultimately lead to higher-paying factory jobs for new advanced carpentry work and bring about new local suppliers of timber as well as competing factories over time. Finally, by accelerating development across the IDEA District, a factory would catalyze an estimated 5.2 million total work hours for all factory-related trades.

Sparkling a Cluster in Urban Innovation

By building on Toronto's existing innovation ecosystem, creating the conditions for innovation, launching a new applied research institute, and establishing a new venture fund for local companies, Sidewalk Labs' plan for the IDEA District can catalyze a cluster focused on urban innovation — and establish an economic engine that drives growth far beyond the eastern waterfront.

Introduction



Strategies

- 1 Invest in a cluster-based approach**
- 2 Build on Toronto's existing innovation ecosystem to grow the field**
- 3 Create the physical, digital, and policy conditions for urban innovation**
- 4 Launch an Urban Innovation Institute as a portal for learning and research**
- 5 Establish a new venture fund for local, early-stage enterprises**
- 6 Benefit Toronto companies and catalyze new ones**

The city's Official Plan articulates the potential for a cluster-based approach to drive meaningful impact in Toronto: "Today, the real competitive advantage for urban economies lies in the foundations that support growth in economic clusters that bring new wealth to the region: a well-educated, highly-skilled labour force; research and development leading to innovation; access to financial capital; adequate infrastructure, including advanced information and communications networks; a dynamic business climate; an enviable quality of life; and safe, cohesive, congenial and inclusive neighbourhoods."⁶³

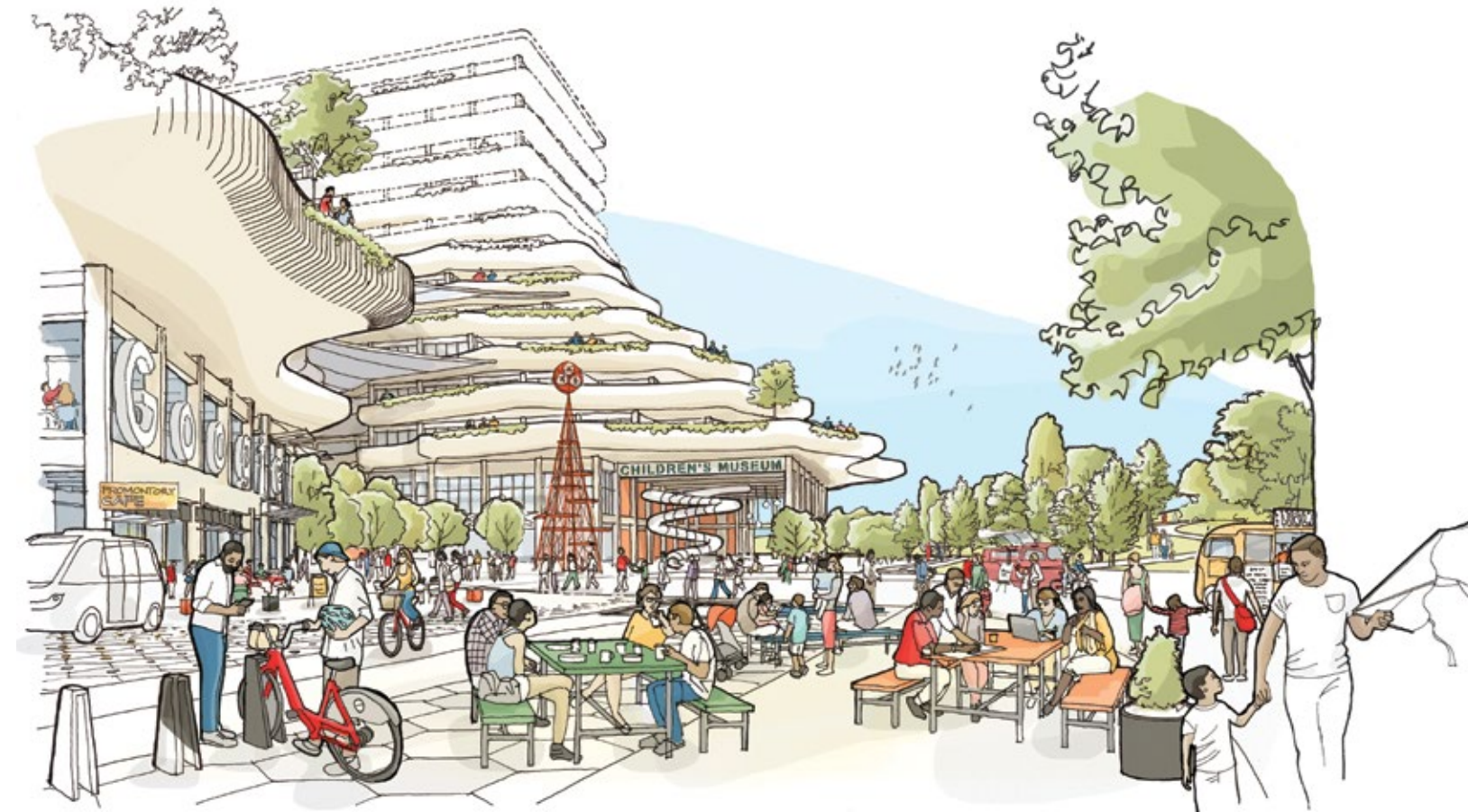
Consistent with these objectives, Sidewalk Labs' approach to sparking a new cluster for urban innovation along the waterfront draws inspiration from global examples of successful clusters but is specifically designed to address the challenges to improving life in cities today. This approach can shape the future of the field, create thousands of jobs, and drive economic opportunity well beyond the waterfront. Part 2 of this chapter outlines the steps necessary to catalyze such a cluster.

First, this cluster would be designed to build on top of Toronto's existing innovation ecosystem, including its world-class academic and research institutions and its support from all levels of government, towards promoting related technology industries.

To build on that foundation, Sidewalk Labs would integrate the unique physical, digital, and policy conditions — found nowhere else at scale throughout the world — necessary to help researchers, entrepreneurs, startups, civic organizations, government agencies, and all third parties tackle difficult urban challenges.

Beyond these unique conditions, Sidewalk Labs plans to further spark this cluster through seed funding for a new Urban Innovation Institute focused on applied research for urban innovation as well as a new venture fund to support local, early-stage enterprises.

Sidewalk Labs believes the combination of these ingredients will create the conditions for innovation, catalyzing economic activity in Toronto, driving meaningful contributions to the field of urban innovation globally, and drawing innovators from around the world to research, invest, explore, build, and scale ideas that can improve the quality of life in cities.



Villiers West has the potential to catalyze economic development across the region, anchored by the new Google Canadian headquarters and an Urban Innovation Institute designed to connect seamlessly with the new Promontory Park.

A new urban innovation cluster would build on and expand Toronto's already robust startup and innovation ecosystem.

Defining the field of urban innovation

Sidewalk Labs was established with the belief that integrating forward-thinking urban design and technological solutions can address big urban challenges and improve quality of life in cities around the world. This set of solutions informs [Sidewalk Labs' definition of urban innovation, broadly described as the interdisciplinary approach to integrating innovations that address all aspects of life in cities into the urban fabric.](#)

By some measures, the field of urban innovation is now the biggest tech sector on the planet, attracting more venture capital investment than high-growth fields like biotech and artificial intelligence. After all, [urban innovation sits at the intersection of two of the defining trends of the 21st century: global urbanization and technological change.](#)

Much more than just the pursuit of urban efficiencies associated with “smart cities,” urban innovation is a diversified set of industries — from mobility to waste management to construction and beyond — in the process of being redefined by capabilities such as ubiquitous connectivity, machine learning, sensing technology, and digital fabrication. Between 2016 and 2017, urban tech’s share of global VC funding surged from 13 percent to 22 percent.⁶⁴ And this is just the start: as mentioned in the chapter introduction, by 2025, the sector’s market value is projected to grow to over \$2 trillion USD.

Just as Sidewalk Labs has employed a comprehensive approach to urban planning that integrates innovations across its core focus areas, advancements in the emerging field of urban innovation often require bringing together players, expertise, and disciplines that might not otherwise intersect in traditional planning practices. The new technologies or solutions that emerge out of this approach are driven by interdisciplinary collaboration and reflect coordination across many stakeholders — public, private, and non-profit sectors alike. They reflect iteration and testing enabled through access to a large-scale, real-world urban environment. And they fall along a broad design spectrum: from highly technical solutions like mobility management systems to more systemic solutions like enabling a new pipeline for mass timber construction.

For example, consider the various players and resources that need to be in place today to make meaningful improvements in housing affordability. Government agencies, financial institutions, private and non-profit developers and operators, housing experts, residents, and community stakeholders all play a part. Developing affordable units today often looks like a series of handoffs between these players, ranging from governmental approvals to redesign processes.

The process of driving affordable housing innovation could be fundamentally different within an urban innovation cluster. Sidewalk Labs’ own strategy creates new financial tools for below-market housing programs, including factory-driven land value, condo resale fees, and affordability by design. It also drives meaningful public-private partnerships, as with the proposed Waterfront Housing Trust and collaboration model with the non-profit sector. These proposed approaches mobilize governments,

developers, academics, and non-profits to work together — and thus more powerfully — to solve a major challenge in Toronto.

Housing affordability is just one aspect of urban life that could benefit from advancements in the field of urban innovation. [Establishing a cluster for urban innovation could provide the necessary conditions and resources to significantly accelerate the pace and frequency of developing innovative solutions to address a wide range of urban issues — from traffic congestion to building design to greenspace access — and further the development of the field overall.](#)

An urban innovation cluster could accelerate the pace of developing innovation solutions for a wide range of issues, from traffic congestion to greenspace access.



Strategy 1

Sparkling a Cluster
in Urban Innovation

Invest in a cluster-based approach

Economic clusters are dense ecosystems of companies, researchers, investors, suppliers, and anchor institutions working together in a similar field. As theorized by economist Michael Porter, clusters boost firm productivity in three ways.

First, the sharing of suppliers, facilities, and infrastructure creates economies of scale that can be realized by firms of all sizes and maturities. Second, clusters enable the pooling of workers with relevant skills and experience, often supported them through specialized degree programs. Finally, clusters accelerate learning driven by physical proximity, vigorous competition, and advanced research by anchor institutions with industry-relevant expertise.

Co-location thus creates outsized gains for cluster participants and accelerates the pace of industry innovation, boosting regional economic performance (including through higher levels of wage and employment growth as well as spillover benefits to related economic sectors) and serving as a critical lever for foreign investment. Across a range of industries, as clusters grow and become more specialized, efficiency and productivity have been demonstrated to increase at an average of 4 to 5 percent.⁶⁵

The benefits of cluster growth apply to fields far beyond computers and technology. In industries as varied as health care, manufacturing, agtech, and more, the cluster model has demonstrated potential for driving transformational impact within a given municipality or economy.

Sidewalk Labs' own approach draws inspiration from several precedents, including cities that are comparable to Toronto in quality of life, innovation culture, and concentration of tech workers, such as Seattle, Boston, and Stockholm, as well as global examples of clusters in other industries, such as Houston's health care hub or the growing agtech hub in St. Louis.

Cities best able to realize the benefits of the cluster are those designed as open systems — with structures and resources in place to not only allow for co-location but to encourage collaboration between firms, institutions, academics, and the public.

In addition to improving regional employment growth over time, economic clusters have the added benefit of improving resilience against potential downturns, contributing to higher rates of employment growth during recessions as compared to economies of other cities as well as faster than average growth rates in the wake of a recession.

Core to the economic resilience of a cluster or economy is the number and vitality of small firms that make up a cluster. While a single company or institution may serve a catalytic role in the creation of a cluster, larger firms may be more vulnerable to external events. Over time, the growth of startups and spin-off businesses is crucial to improving the economic resilience within a given industry or geographic area.

Take Seattle, where major players like Boeing and Microsoft were instrumental in the city's emergence as a globally significant leader in both tech and aerospace. The concentration of talent and expertise drawn to Seattle by these two anchor firms has since spurred the spin-off of over 4,000 companies. The growth of smaller, earlier-stage enterprises has contributed both to the resiliency and overall growth of the tech industry — which rose over 33 percent between 2011 and 2016.⁶⁷

Canadian policy-makers are already focused on the critical importance of traded clusters for economic growth. The federal government's recently announced Innovation Superclusters Initiative, for example, commits close to \$1 billion to support five new innovation "superclusters," from ocean-based industries in Atlantic Canada to digital technology in British Columbia.⁶⁸ There is a concerted regional effort to transform the 110-kilometre Toronto-Waterloo Innovation Corridor into one of the world's leading technology clusters. Local planners and

Best practice spotlight

Houston: A health-care cluster that generates \$20 billion USD annually

In Houston, over 60 member institutions make up a health-care cluster, anchored by the Texas Medical Center Corporation, that employs over 110,000 people and contributes \$20 billion USD annually to the regional economy.

Mixed-use facilities throughout the cluster, all connected by a privately operated transit system, encourage collaboration on shared research priorities that are both relevant to individual members and strategically important to the promotion of Houston's competitiveness on a global scale. Making collaboration across industries more convenient and more valuable has been critical to advancing these goals, spawning groundbreaking work in new fields such as genomics and regenerative medicine, and raising Houston's global profile in health care.

The cluster's success has prompted plans for a new innovation centre, TM3, a 12-hectare campus to support commercialization of research and attract new venture capital entrants. TM3 alone is expected to add an additional \$5.2 billion USD and nearly 30,000 jobs to the local economy, a testament to the virtuous economic cycle created by the cluster's success in supporting an open ecosystem for innovation.⁶⁶



The Texas Medical Center Corporation anchors Houston's health-care cluster. Credit: Monica and Michael Sweet via Getty Images

policy-makers are also leveraging the cluster model to drive economic growth. The Port Lands Planning Framework speaks to the benefits of economic clusters, including the “live-work synergies that will be created with the diversity of employment clusters and uses proposed both in proximity to the new communities, but also in the communities themselves.”

But despite the impressive growth in the field of urban innovation, no city or region has come to dominate the market. Some cities are focusing on subsets of urban technology such as self-driving vehicles (in Detroit), drones (in Calgary), or modular construction (in Singapore). Many more are changing their regulations to accommodate disruptive outsiders such as Uber or Airbnb or are developing “smart city” master plans to incorporate technology into municipal operations. But very few have seized on urban innovation, broadly defined, as an industry in and of itself.

Sidewalk Labs believes that the conditions it plans to help create within the IDEA District will position Toronto to be that place, growing a world-leading cluster in urban innovation that delivers outsized economic benefits to the region.

The challenges facing urban innovators

Clusters are difficult to create in their own right. But for many reasons, the creation and expansion of a cluster in urban innovation poses an even greater set of challenges.

First, urban innovation often requires integration with the built environment, increasing the cost of prototyping, requiring greater coordination among more stakeholders, and making it difficult to test and commercialize early-stage concepts. It can be far more difficult to prototype a new system for flexible, rearrangeable walls in ground-floor retail space, than it is to test a new app on iOS.

Second, urban innovation often requires close coordination with government and existing policy. Take an innovation that is focused on creating more sustainable and cost-efficient street lights that provide brighter and safer night-time environments while using less power. Innovators often must coordinate with formal or informal authorities, even for early testing, to secure necessary input, buy-in, authorization, or permits. Coordination becomes more complicated and time-intensive as innovators move from testing to scale and as new stakeholders introduce additional constraints or complexities.

Finally, unlike other disciplines where innovators are encouraged to fail fast, urban innovation can have higher stakes. Changes to construction technologies

that inadvertently compromise structural integrity are not acceptable — unsafe buildings have significant real-world consequences. The same holds true for self-driving vehicle testing and other innovations that operate in public space.

To help potential innovators overcome these challenges, Sidewalk Labs’ approach to creating an urban innovation cluster on the waterfront is focused on creating the core physical, digital, and policy conditions — in coordination with government. Together these conditions safely minimize and mitigate barriers to urban innovation, increase the ability for a diverse set of entrepreneurs and companies to explore new ideas, encourage the sharing of lessons learned, and accelerate the potential for breakthroughs.

Sidewalk Labs believes an urban innovation cluster would be even more diversified and resilient than a normal economic cluster, spanning a wide range of sectors, building on Toronto’s competitive strengths, and responding to a global demand for city life that is only expected to grow in the coming years. Seeding the urban innovation economy in Toronto would significantly contribute to local efforts to catapult the Toronto-Waterloo Innovation Corridor onto the global stage, generating a wave of new startups and creating strong incentives for Canadian innovators to stay at home.

Sidewalk Labs would work to mitigate barriers to urban innovation, support a diverse set of entrepreneurs and companies, encourage lesson-sharing, and accelerate potential breakthroughs.



Strategy 2

Sparking a Cluster
in Urban Innovation

Build on Toronto’s existing innovation ecosystem to grow the field

Toronto has many of the necessary assets to drive urban innovation: a network of world-class education and research institutions focused on urban issues, demonstrated commitment from government partners, and the fast-est-growing technology economy of any city in the world.

Toronto’s overall population growth is an asset in and of itself, supporting economic activity citywide and a diversity of residents and visitors. Combined with a growing startup ecosystem and ongoing government commitments, the city’s innovation ecosystem is positioned for continued growth and advancements in urban innovation.

The economic engine Sidewalk Labs envisioned for the IDEA District would build on these assets — leveraging partnerships with academic institutions, government partners, and innovators of all types, and creating a physical space and network for experimentation and collaboration.

Leading talent and universities

Toronto is home to a wide network of world-class academic and research institutions, which have consistently placed the city as a global leader in higher education. At the provincial level, Ontario is planning a 25 percent increase in the number of science, tech, engineering, and math graduates over the next five years.⁶⁹

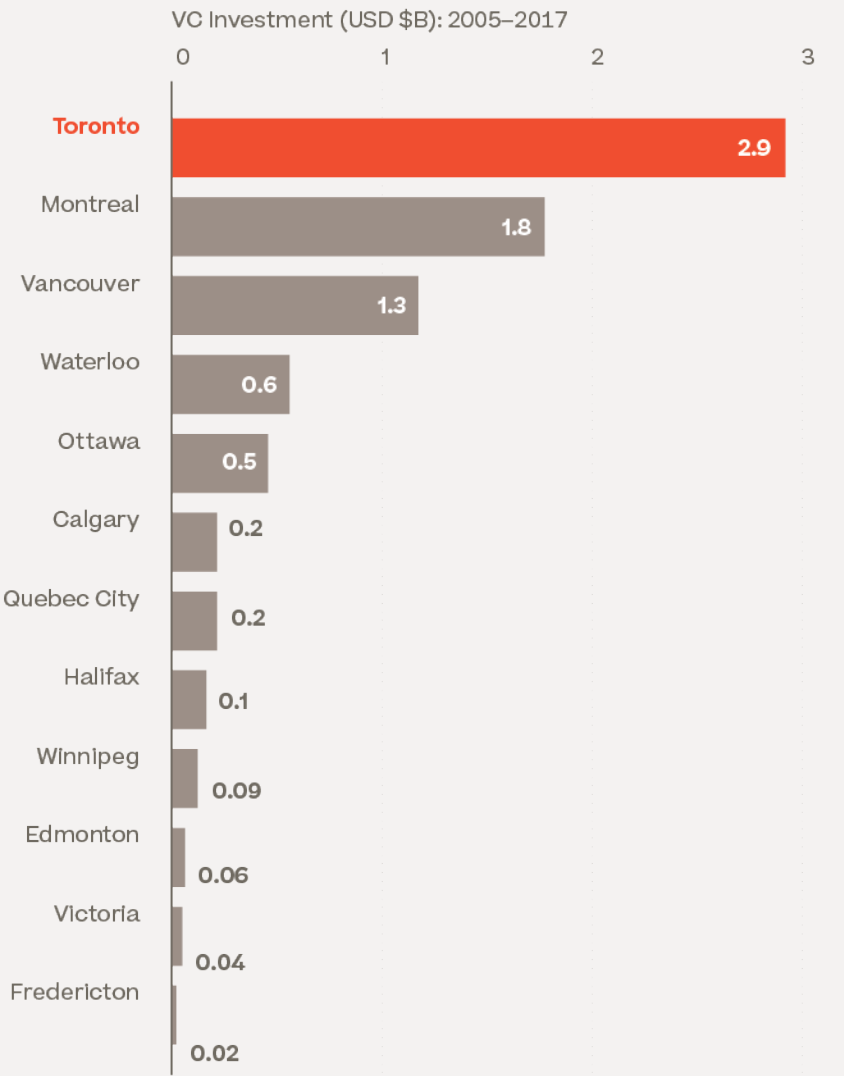
A technology ecosystem is a core component of growing capabilities and expertise in urban innovation. And while Toronto’s academic network already embraces technology and other related fields, recent commitments demonstrate a newfound focus on urban innovation. Leading institutions have invested in expanded departments, new curricula, graduate programs, and research opportunities in urban innovation-related fields.

The University of Toronto alone now has more than 200 faculty and researchers devoted to teaching and research in urban innovation and related disciplines.⁷⁰ Further, designated departments like Ryerson University’s Centre for Urban Innovation and the University of Toronto’s School of Cities, among others, have emerged to drive local thought leadership.

The result of Toronto’s growing leadership in urban innovation is the establishment of a robust talent pipeline. These institutions and others have supported a dramatic increase in the number of graduates in technology-related fields — up 35 percent from 2011 to 2015.⁷¹ Not only does Toronto’s academic network produce top talent, it also draws top academics, researchers, and students from around the globe, in part enabled through Canada’s progressive policies that promote inclusion and make it easier

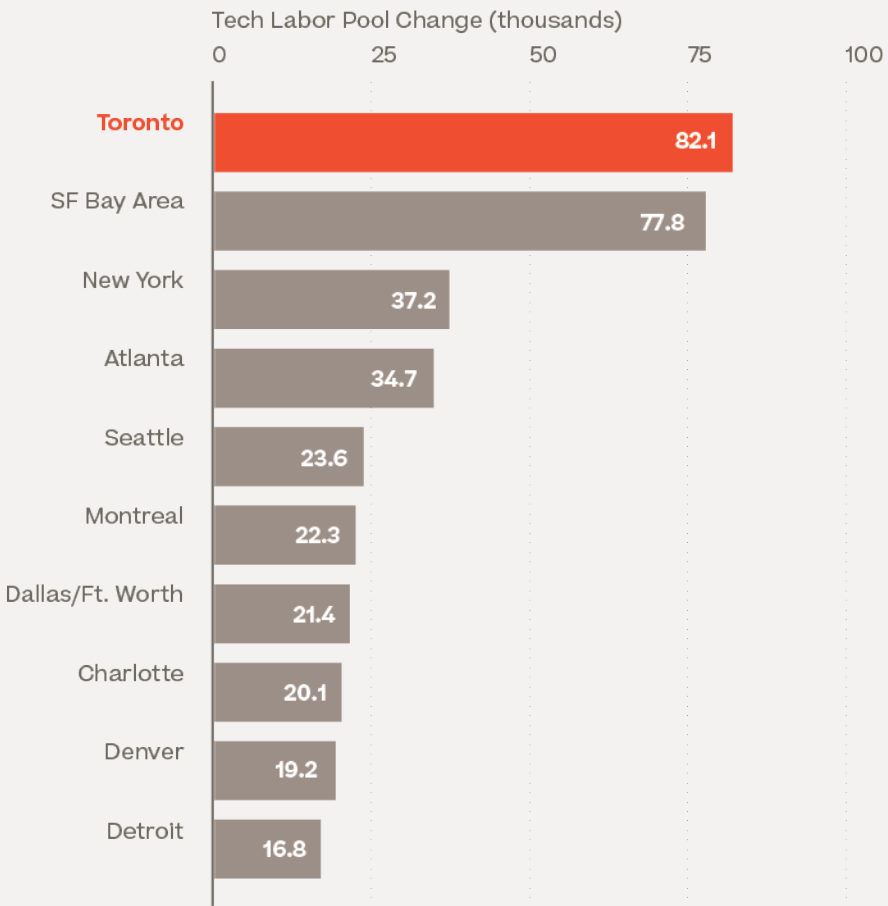
Toronto is home to nearly 40% of all VC investment in Canada

Between 2005 and 2017, enterprises in Toronto received nearly \$3 billion USD in VC funding, representing nearly 40 percent of all VC investment in Canada over that time period.



Toronto’s tech talent pool has outpaced all North American cities since 2012

Since 2012, the growth of tech talent in Toronto has outpaced that of all other North American cities with leading technology industries, supporting a range of occupation areas, including software development and programming; computer support, databases and systems; engineering; and computer and information system management.



for innovators from around the world to study, live, and work in Toronto (particularly compared to the U.S.).

As a result, Toronto is home to one of the most diverse talent pools in the world, which in turn, makes Toronto’s talent pool more attractive to a wider range of employers local and international alike.

Toronto’s growing tech and startup ecosystem

The rapid growth of Toronto’s tech and innovation ecosystem has created a gravitational pull drawing top talent and further investment to the region, which provides an important foundation for the growth of urban innovation as a field. In 2017 alone, Toronto added over 28,000 tech jobs, and it is now home to over 240,000 tech workers, representing an increase of more than 50 percent over the past five years.⁷²

Toronto’s tech sector has demonstrated growth among firms large and small. Several major tech companies — including Shopify, Microsoft, Uber, Pinterest, LG, and Instacart — have established or expanded their footprints in Toronto in the past three years.⁷³ These and other players have increasingly sought to invest in local talent and innovation projects, announcing more than \$1.4 billion of new investments in September 2018 alone.

As a result of these investments and other factors, Toronto boasts a robust ecosystem for local startups and is home to an estimated 2,500 to 4,100 of them.⁷⁴ Based on trends in 2018, Toronto-based companies attract about half of venture capital funding in Canada.⁷⁵ These startups are supported by an ever-growing network of incubators and accelerators, with the ecosystem anchored by large local players such as the MaRS Discovery District, the Vector Institute, and OneEleven, as well as by new entrants such as Techstars.

Government support and funding

Engaged partners at all three levels of government who are committed to promoting the success of high-growth industries, including tech, have made significant investments to grow a culture of innovation. Government support focuses primarily on a specific pain point unique to the Canadian innovation ecosystem: while Canada produces startups in comparable numbers to other cities, small enterprises struggle to evolve into major companies backed by outside capital with global presence, in part due to a lack of access to large customers (such as governments or larger companies) that would create sufficient demand to grow the business.

As a result, governments have prioritized investments in improving access to capital and customers. For example, the Canadian government recently contributed over \$400 million to the Venture Capital Catalyst Initiative,⁷⁶ which provides funding for local cleantech firms, and \$1.1 billion to the new Trade Diversification Strategy, a federal program to help Canadian businesses export to new markets.⁷⁷ Further, Canada has seen a rise in the number and variety of innovation “sandboxes” — interdisciplinary

accelerators that are created by design and technology firms (with support from governmental partners) to enable regulatory innovation and experimentation.⁷⁸ Each of these investments demonstrates prioritization of the tech ecosystem among government leaders and the potential for Sidewalk Labs’ own efforts to leverage partnerships in support of shared values.

Since 2012, the growth of tech talent in Toronto has outpaced that of all other North American cities.

Toronto’s tech ecosystem by the numbers:
→ Over 240,000 tech workers
→ 50% job growth in the past five years
→ Up to 4,100 startups
→ \$1.4 billion of investments in September 2018 alone



Strategy 3

Sparkling a Cluster
in Urban Innovation

Create the physical, digital, and policy conditions for urban innovation

Although Toronto has many of the assets needed to grow a cluster in urban innovation, the IDEA District envisioned in Sidewalk Labs' proposal would provide a unique environment that allows these raw materials to reach new levels of output.

The district would provide an integrated set of specific physical, digital, and policy conditions that together form a platform for urban innovation on which others can act and experiment, creating a magnet for innovators from around the world.

1

Physical conditions.

In its plans for Quayside and proposed approach to the broader IDEA District, Sidewalk Labs has emphasized flexibility and adaptability in the built environment to create the conditions for rapid innovation. Spaces across buildings, mobility networks, and the public realm are designed to meet the needs of the community today, adapt to the changing needs of the community over time in a less costly and disruptive manner, and create opportunities to explore new ideas.

For example, in Quayside, Sidewalk Labs plans to prototype two new types of building space, stoa and Loft, specifically designed to enable buildings to change uses over time. As described on Page 160, stoa is flexibly designed lower-floor space that can make it easier for businesses of all sizes to meet their needs. The easy ability to reconfigure the space provides an opportunity for innovators to prototype new products and services that leverage this flexibility, such as apps that could manage leasing at a micro-scale, or flexible-panel and furniture systems that allow businesses to affordably change their layouts for one-off events.

Beyond the walls of any individual building, dynamic pavement and curbless streets enable greater flexibility in the way roads can be managed, providing not only space for mobility innovators to rethink urban transportation but a canvas for all residents to rethink how the community can re-use space that today is dedicated to parking or vehicle traffic.

Beneath the street, open access channels would house a full range of utilities, from fibre-optic cable to pneumatic waste tubes, in shared space. Locating these systems under removable pavers allows for easy access and greater flexibility to incorporate new systems as they are developed over time.



See the “Digital Innovation” chapter in Volume 2 for more details on the proposed responsible data use process.

2

Digital conditions.

Sidewalk Labs firmly believes that the success of the IDEA District as the hub of an urban innovation cluster should be measured not by the number of Sidewalk Labs' technologies deployed within the district but by the number of innovations created by others. But just like with ecosystems, such as the World Wide Web and the iPhone, third parties depend on open hardware and software as well as on an agreed-upon set of standards and protocols to successfully deploy their ideas.

Sidewalk Labs understands that setting the right governance standards for data and privacy is not the role of a private company — that is why it has proposed the idea of an independent Urban Data Trust to oversee responsible data use in the IDEA District and why it encourages strong action on the part of the Canadian government. But Sidewalk Labs also recognizes its role in creating the right conditions for digital innovation. That is why it has prioritized core digital infrastructure, published standards, and a limited set of launch services.

This proposed infrastructure includes a powerful ubiquitous connectivity network that leverages new advances to improve speed and security, as well as a standardized mount system that reduces the cost of deploying innovations and eliminates vendor lock-in. A set of published

standards around open-data architecture, access, and sources enables third parties to build upon a shared foundation, supported by a common set of security, formatting, and communication standards. Data generated by the launch services would be made publicly accessible (with the proper protections, including de-identification), further catalyzing third-party creation.

3

Policy conditions.

Core to the premise of the IDEA District is an empowered and forward-thinking public administrator that can prioritize innovation and new approaches without compromising the public interest. Many existing urban regulations and policies — such as zoning, building code, and automobile regulations — were designed in an earlier era, when the primary way to achieve necessary public policy outcomes involved sweeping, one-size-fits-all regulations.

These policies — designed around important objectives, such as protecting the public from industrial hazards or over-developing attractive residential areas — now sometimes limit the ability to find creative solutions to the very same problems they attempted to mitigate. Today's digital capabilities enable these policies to achieve their intended outcomes in more flexible ways.

For instance, advanced modelling can help ensure that neighbourhoods and buildings are designed to get adequate greenspace and sunlight without rigid built-form bylaws. Similarly, real-time building sensors that monitor for noise can mitigate the potential downsides of a mixed-use district that accommodates production and light manufacturing, enabling more fluid zoning.

Sidewalk Labs is committed to working with policy-makers and to demonstrating the enormous opportunity available to innovators to create positive outcomes when they work hand in hand with government.

Accelerating the pace of innovation

Together, these three conditions would create a platform for urban innovation that accelerates the development speed and magnifies the impact of new services, tools, and products in the IDEA District.

Consider the various people and organizations that are needed to collaborate on a meaningful solution to traffic congestion: infrastructure and construction companies, municipal regulators and public safety officials, public or private financiers, automotive manufacturers, and technology companies with data or modelling tools to forecast traffic patterns, among many others.

Convening and enabling collaboration among such a wide array of stakeholders tend to occur when the right people meet the right experts, champions, or partners in different fields; when collectively they see the mutual value of collaboration to deliver new breakthroughs; and when they have a physical environment that enables their ideas to be implemented.

The cluster for urban innovation that Sidewalk Labs envisions for the IDEA District would provide exactly this forum: the unparalleled physical space and common conditions required to spur the collisions necessary to drive urban innovation, out-sized economic growth, and better outcomes for residents, workers, and visitors.



Strategy 4

Sparking a Cluster in Urban Innovation

Launch an Urban Innovation Institute as a portal for learning and research

Urban innovation is a field in which applied research, commercial product development, policy development, and new skills development all play a role. To focus all these areas around the most pressing issues facing cities, Sidewalk Labs proposes the creation of an Urban Innovation Institute: an applied research centre focused on urban innovation, uniquely located within a broader environment designed to enable the iterative development of new solutions to urban challenges. Sidewalk Labs believes that, over time, the institute could become perhaps the most critical anchor within the IDEA District for a cluster of economic activity focused on urban innovation.

The Urban Innovation Institute would be the vehicle through which academics, industry leaders, entrepreneurs, and civic actors could access, contribute to, and export the learning made possible throughout Quayside and the IDEA District. In an ecosystem filled with world-class educational institutions engaged in directly relevant subject areas, the Urban Innovation Institute can become the epicentre of integrated, applied research focused on innovative solutions to urban issues. As urbanization increases world-wide, such a knowledge centre in Toronto would have global relevance, building the field of urban innovation, attracting talent from around the world, exporting replicable solutions, and cementing Toronto’s leadership profile.

The Toronto institutions collectively focused on urban issues are engaged in critical work and study around health, cleantech, fintech, infrastructure, economic development, policy, hardware and software engineering, and any number of other fields with relevance to urban innovation. Embedded within the IDEA District, the institute can be the venue through which researchers, students and entrepreneurs from the vast array of universities and colleges throughout Toronto and Ontario — the University of Toronto, Ryerson, George Brown, OCAD, the University of Waterloo, as well as stakeholders such as MaRS and Evergreen — can research, test, develop and scale concepts that fundamentally require the integration of all of these areas.

Sidewalk Labs envisions the Urban Innovation Institute as an independent, non-profit, applied research centre with degree-granting accreditation, and believes it should be designed in collaboration with local academic institutions and stakeholders, both for research purposes and for participation in collaborative degree programs. Once established, the institute could become a critical resource for all of the actors within the Toronto urban innovation ecosystem, providing a unique research and commercialization venue, generating new insights to inform curriculums across

Key Term Urban Innovation Institute

A proposed independent, non-profit, applied research centre focused on urban innovation, designed in collaboration with local academic institutions and stakeholders.



See the “Digital Innovation” chapter of Volume 2 for more details on the proposed responsible data use process.

traditional boundaries of discipline, and serving as a canvas for new areas of study to emerge.

Based on engagement and inquiries to date, Sidewalk Labs believes that the Urban Innovation Institute would also attract the participation of premier educational institutions from around the world. Sidewalk Labs plans to provide upfront financial and convening support to catalyze the creation of the institute, and is committed to helping facilitate the institute’s long-term growth, but does not expect to play any role in its governance or operations once established.

The role of the Urban Innovation Institute

The institute would play several roles within the district’s urban innovation cluster and the broader Toronto innovation ecosystem, as a unique hub of applied research, innovation commercialization and policy acceleration, and skills training for entrepreneurs and workers of the future.



Applied research.

The Urban Innovation Institute would be an organizing mechanism to enable flexible research partnerships across boundaries — whether disciplines, institutions, sectors, or funders — and the development of curriculum to complement those of other institutions. The IDEA District would provide numerous opportunities for the Urban Innovation Institute to be the vehicle through which to structure third-party access and collaborations.

For example, the opportunity for data collection within the IDEA District may have value for research purposes. Through a formal arrangement between the Urban Innovation Institute and the Urban Data Trust, appropriate guidelines, policies, and protocols could be established and enforced to facilitate approved research endeavours. Working in concert with civic organizations and the public and private sectors, the Urban Innovation Institute could conduct research that contributes to the development of replicable operating models that unlock the value of data to address urban issues.

The expertise in conducting research with urban data sets developed within the Urban Innovation Institute would likely make it a sought-after venue for the trusted evaluation of relevant research data sets beyond those generated within the boundaries of the project.

For example, Quayside could provide the full set of tools needed to understand the linkages between the built environment and community well-being. If a public health researcher wishes to study the impact of local air quality on student learning, such an effort is often hampered by the availability of and access to local urban data. The urban data collection made possible by the IDEA District’s infrastructure and data governance model would provide ongoing access to data streams, enabling this type of information to be applied for purposes such as research, predictive analytics, and resource allocation.



Moreover, the proposed Urban Innovation Institute would enable cross-cutting research that could bring together public health, health service delivery, urban planning, environmental, and data analytics expertise to advance this field of research and practice. Sidewalk Labs has begun conversations with the public health community and proposes developing a framework for these cross-disciplinary collaborations and pilots that can inform health research and public health planning and response.

Product research and development.

The Urban Innovation Institute can serve as the mechanism through which entrepreneurs, companies large and small, and organizations can develop prototypes, test new concepts, or connect with others to realize combined value.

As described above, the IDEA District creates the conditions for rapid prototyping — complete with digital infrastructure, a defined approvals process, ubiquitous high-speed connectivity, modular pavement with heating or lighting capabilities, dynamic curbs, and buildings with energy optimization systems, among other features. As ideas proven out in Quayside and Villiers West are adopted throughout the IDEA District, the number of new prototypes being developed on top of these initial services, tools, and products only stands to increase.

In collaboration with Toronto’s rich array of innovation-oriented incubators, the Urban Innovation Institute can help match entrepreneurial research and development with practical applications.

For example, it is currently extremely difficult to test the early-stage commercialization of concepts for urban infrastructure; by definition, infrastructure has to perform as required, with little tolerance for risk. Quayside’s core conditions would make it possible to test whether new devices for urban infrastructure — new traffic-management devices, new types of sidewalk furniture, even new network utilities — work with the reliability and accuracy that urban hardware requires in a safe way.

Similarly, the last decade has seen an explosion of new tools that operate in public space, from e-scooters to smart garbage cans. Early deployments of these ideas tend to rely on trial and error, with both new uses and negative consequences slow to be noted and documented. The IDEA District’s infrastructure, management, and population make it the perfect setting to understand interactions between pedestrians and self-driving vehicles; new wayfinding techniques; new accessibility designs; and new on-demand businesses that might make use of the neighbourhood’s freight system.



Policy research and development.

The research and development surrounding urban innovation is not limited to those with commercial intentions. Equally important are opportunities for policy makers, public sector entities, civic institutions, academics, and non-profit organizations to undertake research and participate in product research and development.

Developing effective governance and policy approaches to enable innovation in cities is critical, and the effective adoption and management of urban innovation requires new public and civic tools, skills, processes, and approaches. Playing a role in such civic dialogue would be a critical element of the mission for the Urban Innovation Institute, which can potentially also be relied on by the public sector to monitor and evaluate the outcomes achieved within the IDEA District.

The Urban Innovation Institute can connect multiple elements of the ecosystem required to enable practical product development and to undertake research. As the middle point between entrepreneurs, academics, funders, policy-makers, and government administrators — as well as the array of innovation incubators such as MaRS — the Urban Innovation Institute can make a substantial contribution to the development of Canadian intellectual property.



New skills development.

Sidewalk Labs believes that the same conditions within the IDEA District that will foster applied research and product

development could also help inform curriculum throughout all levels of education and academia. The Urban Innovation Institute could provide an array of coursework to integrate with programs such as those offered by the University of Toronto's School of Cities or its Master of Urban Innovation program, or to enable cross-disciplinary coursework or field work to supplement Ryerson University's Centre for Urban Innovation curriculum.

Over time, the Urban Innovation Institute could develop a breadth of graduate level coursework and models for cross-disciplinary research to support collaborative degree granting programs. Through these programs, the institute could become an asset to help Toronto's institutions attract and retain faculty and students, building a world-leading brain trust and local network focused on the practical application of urban innovation.

The IDEA District also presents unique opportunities to translate the insights gained across many fields — such as environmental studies, civil and digital engineering, physical and digital design, and the integration thereof — into curriculums, internships, and practicums for pre-university students from a diversity of backgrounds. These same insights can also serve as the basis for training programs for adults seeking new, forward-facing technical skills, potentially in collaboration with Sidewalk Works and the numerous Toronto organizations focused on workforce development.

From inception, the mission of the institute would include this type of knowledge development as a core part of its focus.

Creating the Urban Innovation Institute

Sidewalk Labs envisions the Urban Innovation Institute as an independent, non-profit institute with its own self-sustaining governance and business model. Creating a new institution is no small task, however, and requires drive, focus, and dedication, as well as capital. Over time, the institute could become self-sustaining through a combination of research funding, collaborative degree programs, and potentially innovative approaches to technology transfer and intellectual property. For example, Waterfront Toronto and the government could choose to dedicate a portion of the revenues generated from technologies developed within the IDEA District to the institute.

Sidewalk Labs is prepared to provide **\$10 million** in initial seed funding for the Urban Innovation Institute.

It is of paramount importance that the institute be developed in close collaboration with a consortium of Toronto institutions, as well as stakeholders within the public and private sectors.

These potential funding strategies would have to be explored in depth within the phase of work to create the institute.

Given the importance of the Urban Innovation Institute to the mission of the overall Sidewalk Toronto project and to the Toronto urban innovation ecosystem, Sidewalk Labs is prepared to provide \$10 million in initial seed funding, to be administered by an entity to be agreed-upon during the planning process, for the first phase of the development of a comprehensive mission, operating structure, and governance model.

It is of paramount importance that the institute be developed in close collaboration with a consortium of Toronto institutions, as well as stakeholders within the public and private sectors. Sidewalk Labs proposes that it work with the aforementioned entity to convene stakeholders; to provide support services that facilitate the development of an institutional mandate, governance structure, operating organization, and business model; and to stand up the initial phase of the institute.

To ensure the realization of the institute thereafter, Sidewalk Labs may provide additional grants in the future alongside partners, linked to project milestones to be agreed in the implementation agreements (including with respect to appropriate government support).

How applied institutions have catalyzed clusters

Academic and research institutions have historically played an important role in the development of clusters, in particular as an initial anchor that could draw complementary businesses and research institutions to the area.

In St. Louis, for example, BioSTL (a bioscience industry organization), the Danforth Center, and the St. Louis Economic Development Partnership, among other partners, support a cluster for agriculture technology that has embraced a collaborative governance model to prioritize industry input and balance both research and commercialization activities. The cluster has experienced rapid growth in just 10 years, anchored by its proximity to world-class research centres, major food producers with expertise in the industry, and an emerging startup ecosystem.

An urban innovation cluster with an academic institution at its core is positioned to ensure the advancements produced in the district contribute to training and educational opportunities, creating a virtuous cycle that grows human capital and creates a broader ecosystem of resources for testing and deployment of new innovations. An academic or research institution within a cluster could facilitate knowledge exchange and provide a forum for applied research, in turn drawing talent and investment and establishing the area as a hub for thought leadership.

The following case studies demonstrate the potential impact Sidewalk Labs

expects could be realized through the creation of an Urban Innovation Institute in the IDEA District.

Vector Institute.

The Vector Institute — launched in March 2017 with support from the Government of Canada, the Province of Ontario, and private industry,⁷⁹ and in partnership with multiple universities — seeks to “drive excellence and leadership in Canada’s knowledge, creation, and use of artificial intelligence (AI) to foster economic growth and improve the lives of Canadians.”⁸⁰

Specializing in machine and deep learning, the institute retains elite faculty and researchers to lead Ontario’s efforts to build and sustain AI-based innovation across the public and private sectors. An example of this type of collaboration includes the institute’s partnership with the Peter Munk Cardiac Centre and University Health Network to apply machine-learning research towards improvements in cardio-vascular care.⁸¹

The institute represents a strong model for how Toronto institutions could come together to advance innovation and tech commercialization. Vector is an independent, non-profit, non-degree-conferring entity that works closely with partner universities where institute researchers have existing appointments. The organization’s \$135 million endowment (over its first five years) comes from both public and private sources,⁸² and its leadership team reflects representation from both sectors.



Incentivized through the provision of \$100 million USD in funding and free land from the City of New York, Cornell Tech has already developed the first phase of its \$2 billion USD campus, growing to over 30 full-time faculty and over 300 students. Credit: Sidewalk Labs

Cornell Tech.

In 2011, the City of New York launched an international competition for the establishment of a new graduate campus for applied science and engineering on Roosevelt Island.⁸³ The city determined that the technology sector within the city’s ecosystem was missing a top-tier applied sciences program that could serve as a source for talent and a long-term anchor for growth. The winning proponent was a partnership between Cornell University and the Technion-Israel Institute of Technology, responsible for the development of the Cornell Tech campus, which opened in 2017.⁸⁴

Incentivized through the provision of \$100 million USD in funding and free land from the City of New York, Cornell Tech has already developed the first phase of its \$2 billion USD campus, growing to over 30 full-time faculty and over 300 students.⁸⁵ Cornell Tech’s degree programs (integrating technology, law, business, and design), integration of academia and industry, and emphasis on entrepreneurialism and social impact are already leading to substantial impacts.

As a catalyst for citywide economic growth, Cornell Tech has developed partnerships with companies across tech, finance, media, healthcare, and other industries; engaged in programs throughout the New York City public schools; and catalyzed significant economic activity in neighbouring Long Island City.

What it means to work in the IDEA District

The urban innovation cluster that emerges throughout the IDEA District is designed to be an open ecosystem, enabling both residents and workers, as well as people from around the world, to take advantage of the unique physical, digital, and policy conditions. The following examples illustrate a few ways innovations can launch, operate, and grow in this environment.

Launching a Canadian sensor startup.

A Canadian sensor startup, founded by two University of Toronto graduates, has a concept to improve energy management in buildings through the monitoring and optimization of building entrances and design. At a symposium at the Urban Innovation Institute on building efficiency, employees at the startup meet developers who are about to break ground on a new mixed-use building in the IDEA District. The employees pitch their sensor, and the potential for decreased utility costs is attractive to the developers, who decide to run a pilot in their new building. After completing the responsible data use process and gaining approval from the Urban Data Trust, the startup creates prototypes of the new sensors, runs the pilot, and demonstrates the value of their hypothesis.

After the study, the startup accesses investors through the Urban Innovation Institute and raises capital to bring the sensors to market. Simultaneously, the potential for greater building efficiency standards sparks the IDEA District administrator to re-evaluate its standards for future development within the district.



Keeping residents and visitors informed.

After a summer afternoon in Quay-side, a Toronto resident finds herself excited by the action at a dynamic curb along Queens Quay East but is concerned about the data that is being collected to make that system work. She attends a free workshop on data privacy regulations at the Urban Innovation Institute and

hears from private companies and public officials about how and why data is collected in the IDEA District and about the safeguards that are in place to ensure the data is used responsibly. She also learns that she can go to an online registry overseen by the Urban Data Trust to view the data being collected by the curb system and the location of any digital devices in public space.

Empowering public-sector improvements.

An international city manager is facing challenges in monitoring new construction that may pose safety concerns. She finds an Urban Innovation Institute publication about new advanced mapping technologies and plans a trip to the IDEA District to learn best practices. After meeting with Toronto city officials, local developers, and

researchers, she returns to her home city and uses IDEA District best practices to deploy advanced mapping to identify illegal or dangerous building modifications. She shares her implementation data with the Urban Innovation Institute, which updates its open database so that others from around the world can leverage these lessons in their own city.



Supporting small-business growth.

A Canadian financial services company wants to bring a new form of flexible small-business loan to market. The company decides that the conditions within the IDEA District — particularly the flexible stoa space, digital credentialing system, and active public oversight — make it the perfect place to pilot this new offering. As a prototype, the company

allows small-business owners in the IDEA District to apply for a seed loan along with their lease application, making the process much easier. Stoa retailers could apply and be approved instantly, and the financial services company knows that applications come from real businesses with real qualifications, thanks to their digital credentials.



Strategy 5

Sparkling a Cluster
in Urban Innovation

Establish a new venture fund for local, early-stage enterprises

The rapid growth of Toronto's startup ecosystem in recent years has not come without its challenges. Like many growing industries or sectors, Toronto faces issues of inequality and lack of access to limited resources, especially for smaller players in the market. Compared to startups in other cities, small startups in Toronto face significant challenges to scaling their enterprises. The rate of new startups emerging has far outpaced the amount of VC funding available, forcing entrepreneurs and businesses to slow down development and growth or seek funding elsewhere.

To help tackle these challenges, Sidewalk Labs plans to provide initial capital to establish a new venture fund to support local entrepreneurial activity in urban innovation, designated for Ontario- and Toronto-based entrepreneurs and enterprises. *Sidewalk Labs plans to contribute \$10 million to the venture fund and seek additional funding from local partners to increase the size of the overall investment.*

The fund could help fuel growth for startups benefiting from the ecosystem created by the digital infrastructure and open standards within Quayside, Villiers West, and the overall IDEA District, or for researchers at the Urban Innovation Institute looking to commercialize new insights. *Sidewalk Labs will look to partner with Toronto-based innovation incubators to provide shared services, research*

support, and flexible space within Quayside and Villiers West, and to ensure that early-stage portfolio companies are able to tap into the networks, resources, and opportunities generated by the urban innovation cluster.

Sidewalk Labs' venture fund would focus on early-stage investments and be specifically designed to help Canadian ventures and entrepreneurs overcome challenges in Toronto's market, providing the necessary capital for startups and small businesses to become larger-scale enterprises. The fund could help a range of innovators: from recent Waterloo graduates developing a new product, to a team that permanently relocated to Toronto as part of the Startup Visa program, to repeat entrepreneurs looking for a strategic partner to help them develop, iterate, and scale faster.

By prioritizing investments for local ideas and innovators, this fund could help catalyze and support the growth of a new ecosystem for urban innovation in a way that encourages Canadian talent to stay home. The development of a local, targeted investment ecosystem has proven benefits in other global clusters. For example, the agtech cluster in St. Louis was facilitated initially by BioGenerator (the cluster's dedicated investment arm),⁸⁶ which helps prepare firms to raise

capital and connect with institutional investors. St. Louis' agtech sector was projected to reach \$90 million USD in VC money in 2018,⁸⁷ more than a 440 percent increase over the past four years.

Despite being home to world-class universities and an ever-growing technology and innovation sector, Toronto faces ongoing challenges in ensuring that the talent and expertise developed within the GTA has access to the necessary structures and resources to contribute back into the local innovation ecosystem. Between 2015 and 2016, two-thirds of software engineering students from top programs — including the Universities of Waterloo, British Columbia, and Toronto — accepted positions outside of Canada after graduation.⁸⁸ In addition to recent graduates, small businesses and startups

are being drawn to set up or grow their enterprises internationally, resulting in "brain drain" throughout the industry. Businesses and startups with different needs cite a range of factors driving their decisions to relocate: from a lack of local available funding to better commercialization opportunities, to lower-cost office space, to wider networks of resources outside of Canada.

With more advanced options for early-stage venture funding, Sidewalk Labs aims to help contribute to the region's ability to retain talent and IP locally. Sidewalk Labs expects to work collaboratively with other local funders, either as co-investors in the fund or as additional investors in the portfolio of companies supported. *By working with existing angel, venture capital, corporate and ecosystem players, Sidewalk Labs aims to help provide a foundation for the development and growth of the urban innovation industry. This approach provides an opportunity for a wider array of players to work with Sidewalk Labs to foster a local system of innovation and investment with the potential to sustain lasting economic opportunity in urban innovation for years to come.*

Sidewalk Labs' venture fund would focus on early-stage investments and be specifically designed to help Canadian ventures and entrepreneurs overcome challenges in Toronto's market.



Benefit Toronto companies and catalyze new ones

Sidewalk Labs believes that the combination of the unique conditions of the IDEA District and the catalytic impact of the Urban Innovation Institute could spark a cluster that supports companies, projects, and individuals across a full spectrum of industries, at varying stages of maturity.

For example, Stockholm’s emergence as a global tech hub demonstrates a successful approach to supporting a wide range of players and functions. Anchors like Ericsson, Spotify, Skype, and King support a robust and diverse tech sector that is attracting global talent, while also driving a strong startup culture in video game development and music technology. The growth of existing and new capabilities has in turn drawn significant investment, 67 percent of which comes from outside of Sweden.⁸⁹ After Silicon Valley, Stockholm is home to the highest number of “unicorn startups” per capita (valued at over \$1 billion USD), and Stockholm’s tech companies have generated over \$4 billion USD in funding, creating a robust local ecosystem for innovation and investment for players of all sizes.

Sidewalk Labs anticipates that the waterfront’s urban innovation cluster, which would bring together a set of innovators from even more diverse disciplines, could have a similar effect. The cluster would support industries and capabilities where Toronto already plays a leading role, such as AI; provide critical resources to attract growth in emerging industries, such as

self-driving vehicles; and provide the conditions needed to spark growth and scale nascent industries that have yet to take off globally, such as autonomous freight.

Over time, the IDEA District would lead to new discoveries that cannot yet be imagined, but from which wholly new industries may emerge that change the way people live in cities around the world.

Established fields, poised for rapid growth.

For established fields, the urban innovation cluster could provide physical space for large-scale experimentation and the necessary concentration of talent to enable rapid growth. Toronto is already a leader in AI, for example. Canada was the first country to announce a national strategy for artificial intelligence — the Pan-Canadian Artificial Intelligence Strategy — which came with a commitment of \$125 million over five years by the federal government and has catalyzed investment from other levels of government as well as over \$100 million from the private sector to support the industry’s growth.⁹⁰

To build on this momentum, the IDEA District presents an additional asset to support the realization of government objectives: a forum for interdisciplinary collaboration, a concentration of resources and investment, and the ability to test new technologies. Together, these

conditions can enable faster paths to the discovery of new applications and uses of AI to tackle urban challenges, supporting the growth of the larger field.

Emerging industries building momentum.

For emerging fields, the urban innovation cluster could provide resources to help industries overcome technical challenges, develop new capacities, and gain broader market acceptance and consumer support on an accelerated timeline compared to what might otherwise be possible.

Take the self-driving mobility industry, which is already gaining momentum in Ontario. Both the University of Ontario Institute of Technology’s Automotive Centre of Excellence and the Waterloo Centre for Automotive Research (WatCAR) have a history of supporting advancements in automotive technology. Major automotive companies are building innovation and testing facilities, too, including GM’s Urban Mobility Campus,⁹¹ located in close proximity to the eastern waterfront, and Uber’s engineering research centre.⁹² The City of Toronto is also building on this momentum; in partnership with the TTC and Metrolinx, Toronto has secured more than \$1 million in funding from Transport Canada to operate a pilot project for self-driving shuttles, which, if approved, would begin in 2020.⁹³

Despite these leading-edge investments, the large-scale market adoption of self-driving vehicles is not around the corner. But by providing the opportunity to responsibly test vehicles in an urban environment, the urban innovation cluster could enable a world-class testing, research, and engineering centre that could make self-driving vehicles a reality at scale at a dramatically accelerated pace.

Nascent industries seeking scale.

For more nascent fields that might need support or intervention to scale up, the urban innovation cluster could provide greater and more immediate access to all of the tools required for growth. Supporting nascent industries has been a core priority demonstrated through Waterfront Toronto’s recent work along the waterfront and a critical objective in its RFP for an Innovation and Funding Partner, which called for “a testbed for Canada’s cleantech, building materials and broader innovation-driven sectors to support their growth and competitiveness in global markets.” Entrepreneurs and companies that make up nascent industries would be able to share resources and expertise, leveraging opportunities for growth that might not otherwise be available.

The tall timber industry is a prime example of how the cluster could leverage Toronto’s unique innovation assets while providing resources and expertise to expand the city’s innovation ecosystem. Sidewalk Labs has committed to the widespread adoption of mass

timber-based construction methods, over the use of more traditional building materials like steel and concrete. But despite the significant environmental, financial, and building efficiency benefits of timber-based construction, it has not yet been deployed at scale, particularly in an urban context. An urban innovation cluster at the waterfront, supported by researchers and innovators in building technologies, would provide an opportunity for Toronto to capitalize on the momentum created by building an

entirely timber Quayside and become a global leader in the ongoing development of mass timber and, more broadly, the field of building materials innovation.

Industries that cannot yet be predicted.

A measure of a successful cluster is not only its ability to support the companies and industries that exist today, but to provide a platform to nurture and catalyze the development of new ideas and capabilities in the future — some of which the world cannot yet anticipate.

A measure of a successful cluster is its ability to nurture the development of new ideas and capabilities in the future.

The unique conditions of the IDEA District and the catalytic impact of the Urban Innovation Institute could spark a new cluster that supports a range of companies and individuals.

Measuring Impact

The IDEA District would spur the creation of 93,000 total jobs and generate \$14.2 billion of annual GDP output by 2040 — nearly seven times Toronto’s current projections for the area. It would also generate vast construction tax revenue and roughly 174,000 construction jobs, via the largest building project in North America.

Spurring the creation of 44,000 direct jobs and 93,000 total jobs

Applied across the entirety of the IDEA District, Sidewalk Labs’ approach to activating the waterfront has the potential to change the economic development impact of the area, including catalyzing 44,000 direct jobs by 2040. This projected growth represents an increase of approximately 25,000 in direct jobs compared to the baseline scenario at its completion in 2050, as envisioned in the Port Lands Planning Framework and other existing planning documents.

Projected job growth will not just be confined to the boundaries of the IDEA District. The district’s development can stimulate the creation of an additional 49,000 indirect and induced jobs across industries, skill levels, and companies throughout Toronto, Ontario, and Canada — creating an aggregate total of over 93,000 jobs.

But it is the composition of these jobs, beyond simply their existence, that could be most impactful for Toronto. The IDEA District’s emphasis on innovation, entrepreneurship, and exploration likely means that a higher percentage of jobs would be created in fields such as professional and scientific and technical services (more than five times the baseline total, based on the urbanMetrics report), raising the projected average wage for all jobs in the IDEA District to \$70,000 — a 17 percent increase from the approximately \$60,000 based on the rough proportion of jobs in the Port Lands Planning Framework.

Further, research suggests that high concentrations of employment in tech-related fields have the potential to drive increased wages for a range of other job types, including those that do not require a degree. For every “high-tech” job created, approximately five non-tech jobs are created, across a wider range of functions and industries and accessible to a broader range of people.⁹⁴

The 44,000 permanent, full-time, direct jobs that emerge in the IDEA District would generally fall into three broad categories: industrial, population-based services, and knowledge-based industries.

Industrial. First, the district would maintain a small but core mass of industrial jobs in industries such as light manufacturing and transportation. In its analysis, urbanMetrics estimates that this segment could account for 2,500 of the 44,000 jobs within the IDEA District.

Population-based services. Second, the district would be home to thousands of jobs in population-based services that are the foundation of all local economies, primarily selling products and services for the local market. This segment includes the professions of teachers, doctors, and retail jobs. These jobs would create economic opportunities for people with a range of educational backgrounds and

Projected average income in the IDEA District: \$70,000

The IDEA District has the potential to realize substantial job growth across all industries and income levels, in comparison to existing proposals. The district can achieve this growth through a significant amount of commercial and retail space intended for companies of all sizes and missions, allowing for the cultivation of a business community that is accessible to all educational backgrounds. This diversity of jobs and skill levels would bring the average income within the area to an estimated \$70,000.

	Average Industry Income (Toronto Census Metro Area)	Percentage of IDEA District Job Total
Industry		
Professional, Scientific, and Technical Services	\$73,286	30.0%
Information and Cultural Industries	\$69,376	14.9%
FIRE (Finance, Insurance, and Real Estate)	\$94,428	12.5%
Management of Companies and Enterprises	\$122,377	10.0%
All Other Services	\$48,328	10.0%
Health Care and Social Assistance	\$53,251	5.0%
Accommodation and Food Services	\$22,164	5.0%
Retail, Wholesale, Transportation, and Warehousing	\$45,081	5.0%
Administrative Support, Waste Management and Remediation	\$34,324	5.0%
Goods-Producing Sector	\$56,986	2.4%
Average income across all categories		\$70,422

Note: The table above includes only permanent, direct employment within the IDEA District. It includes neither the indirect and induced jobs catalyzed by this permanent employment, nor the direct, indirect, and induced jobs associated with the project’s building and infrastructure construction.

skill sets. In its analysis, urbanMetrics estimates that this segment could account for approximately 12,000 of the 44,000 jobs within the IDEA District.

Knowledge-based industries.

Finally, the district would be home to tens of thousands of jobs in knowledge-based industries — such as technology, finance, professional services, and creative fields, including the film industry — drawn to the concentration of talent, new flexible and affordable office spaces, and strong connectivity to the downtown core and regional transit. An initial anchor of this segment would be Google's Canadian headquarters, with up to 500,000 square feet, which would be sufficient to accommodate as many as 2,500 jobs, the majority of which would be for

Google employees (though actual hiring will depend on market conditions and business requirements). In total, urbanMetrics estimates that knowledge-based industries could account for approximately 29,500 of the 44,000 jobs within the IDEA District.

Over time, Sidewalk Labs predicts that a substantial portion of the jobs created within the knowledge-based industries segment would fall under the umbrella of urban innovation, drawn specifically by the unique conditions created as part of the IDEA District. Sidewalk Labs estimates that more than a third of the 29,500 knowledge-based jobs created in the IDEA District would fall into this emerging field. These 10,500 jobs would be the core of a cluster in urban innovation that has the potential to become a new economic engine for Toronto.

For every “high-tech” job created, approximately five non-tech jobs are created.

Research has found that high concentrations of employment in tech-related fields have the potential to drive increased wages for a range of other job types, including those that do not require a degree.

Nearly seven times the potential annual GDP impact

The new economic ecosystem envisioned for the waterfront, with a cluster for urban innovation at its core, has the potential to transform the eastern waterfront into a dynamic, diversified, and inclusive growth engine capable of generating new opportunities in Toronto and beyond. As a significant economic stimulus for the country, the accelerated development of the IDEA District could create many higher-paying direct and indirect jobs, generating billions of dollars in additional tax revenues at all three levels of government and, critically, producing significant GDP gains.

Building on Toronto's competitive strengths, Sidewalk Labs could spark the development of the waterfront and have a broader economic impact through a series of transformative investments, including in district-scale infrastructure, the Urban Innovation Institute, a new Canadian headquarters and a connected campus for Google, a venture fund for local enterprises, and a policy framework designed to encourage experimentation and innovation while protecting health, safety, and privacy.

By embracing a cluster-based model, Sidewalk Labs anticipates supporting a new network of neighbourhoods with unparalleled economic opportunity for

all residents and businesses, whether or not they participate directly in the urban innovation economy. A cluster for urban innovation would improve regional economic growth over time and improve the resilience of the local and broader economies against downturns in the future.

Further, introducing anchor tenants to catalyze the development of the cluster enables the district to attract future investment and talent and position the IDEA District, and Toronto on the whole, as a global leader in urban innovation. Sidewalk Labs believes the benefits of investing resources into the local innovation ecosystem will extend well beyond the waterfront — enabling a virtuous cycle of investment and innovation, and ensuring the sustainability of urban innovation as a core economic sector that can benefit the city and country for decades to come.

The Toronto firm urbanMetrics estimates that the growing global profile of the IDEA District could generate an estimated \$14.2 billion in economic output for Canada each year (GDP), including \$11.8 billion in Toronto, which represents a more than six-fold increase in value added to the Canadian economy compared to status quo development by 2040.

The IDEA District: \$14.2 billion in economic output and 93,000 jobs

Nearly seven times as many jobs by 2040

	Baseline scenarios	IDEA District	
Toronto	11,601	79,025	6.7X more jobs
Ontario	944	5,945	
Canada	1,288	8,164	
Total	13,833	93,134	

Nearly seven times the annual GDP contribution by 2040

	Baseline scenarios	IDEA District	
Toronto	\$1,723,717,641	\$11,769,431,015	6.7X more value
Ontario (not including Toronto)	\$192,885,909	\$1,198,827,313	
Canada (not including Ontario)	\$202,173,751	\$1,238,055,343	
Total	\$2,118,777,301	\$14,206,313,671	



Impact 3

Measuring Impact

The largest city building project in North America

The one-time investment in infrastructure and buildings related to the Sidewalk Labs proposal has the potential to generate enormous value. An estimated \$18 billion in new building construction — across the IDEA District — would be a nearly 49 percent increase over the amount spent within the baseline scenario.

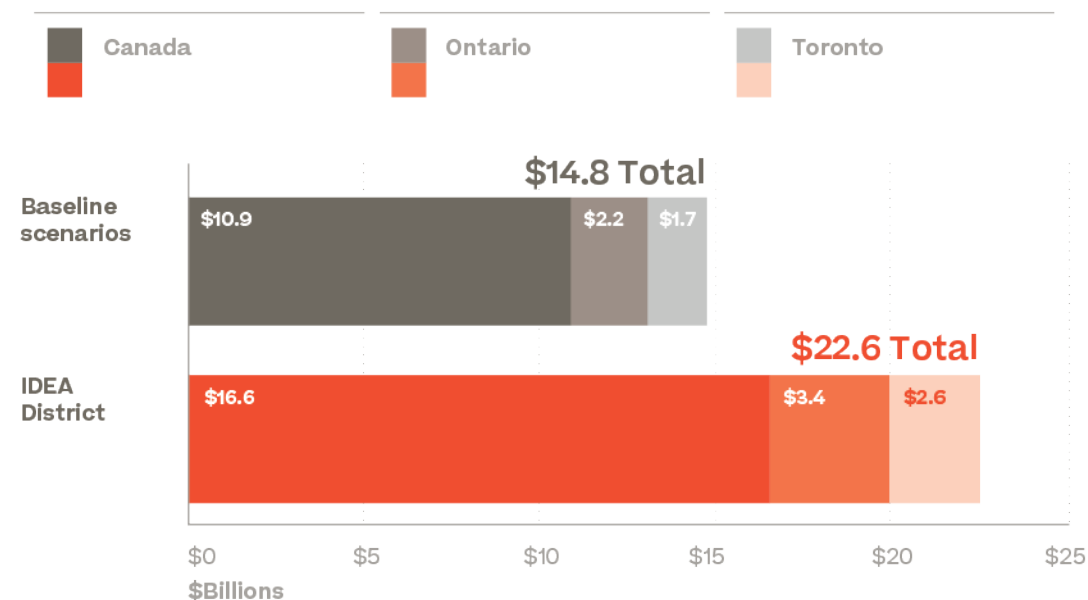
If the Sidewalk Toronto project proceeds at the proposed scale of the IDEA District, it would quickly become one of the largest construction projects in the world, providing an enormous number of jobs and generating tremendous value to a city that already has more cranes dotting its skyline than any other in North America. The urbanMetrics analysis suggests that, all told, between buildings and infrastructure, the project's construction

could add more than \$22.6 billion in value to the Toronto economy and create over 174,000 person-years of full-time employment. In total, the infrastructure and buildings construction represent an 18 times multiplier to the government's initial \$1.25 billion investment in the Don Mouth Naturalization Project.

Sidewalk Labs' proposed development program, if scaled across the IDEA District, would require the annual production of over 55,000 cubic metres of mass timber, enough to require the output from a dedicated factory factories supplying only this project and to support an estimated 2,500 person-years of employment over the next 20 years.

More than 50% increase in total construction GDP contribution at completion

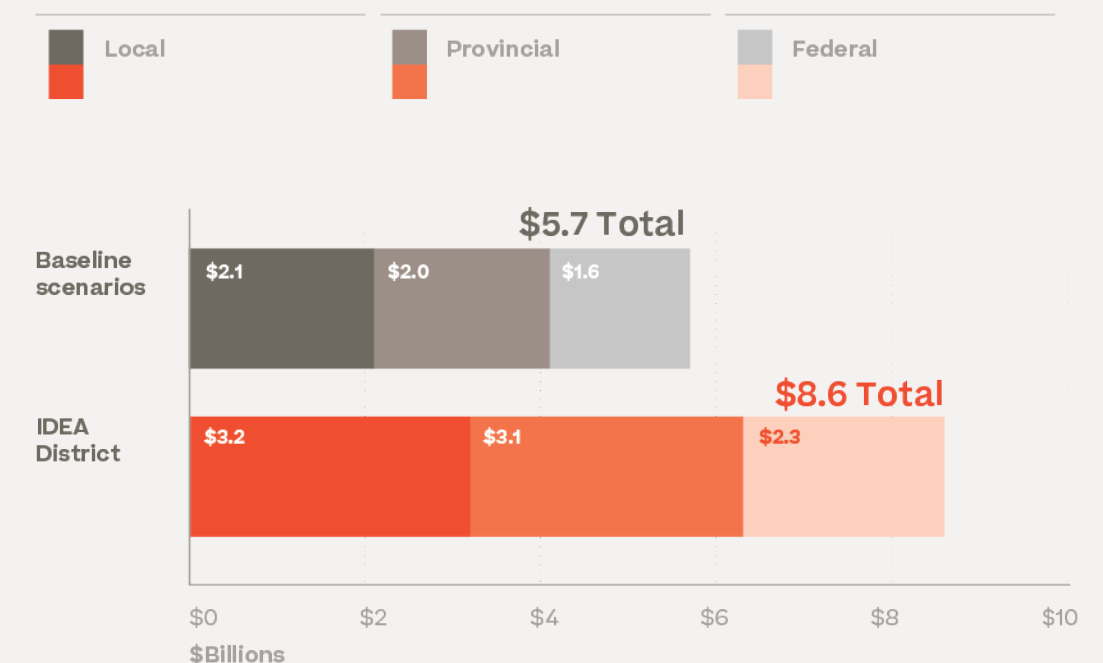
The vertical and infrastructure construction of the IDEA District would contribute an estimated \$22.6 billion to the Canadian economy, approximately \$8 billion more than the baseline scenario. This impact includes a one-time contribution of over \$16 billion to the Toronto economy.



One-time construction impact: \$22.6 billion in GDP, \$8.6 billion in taxes, and 174,000 jobs by 2040

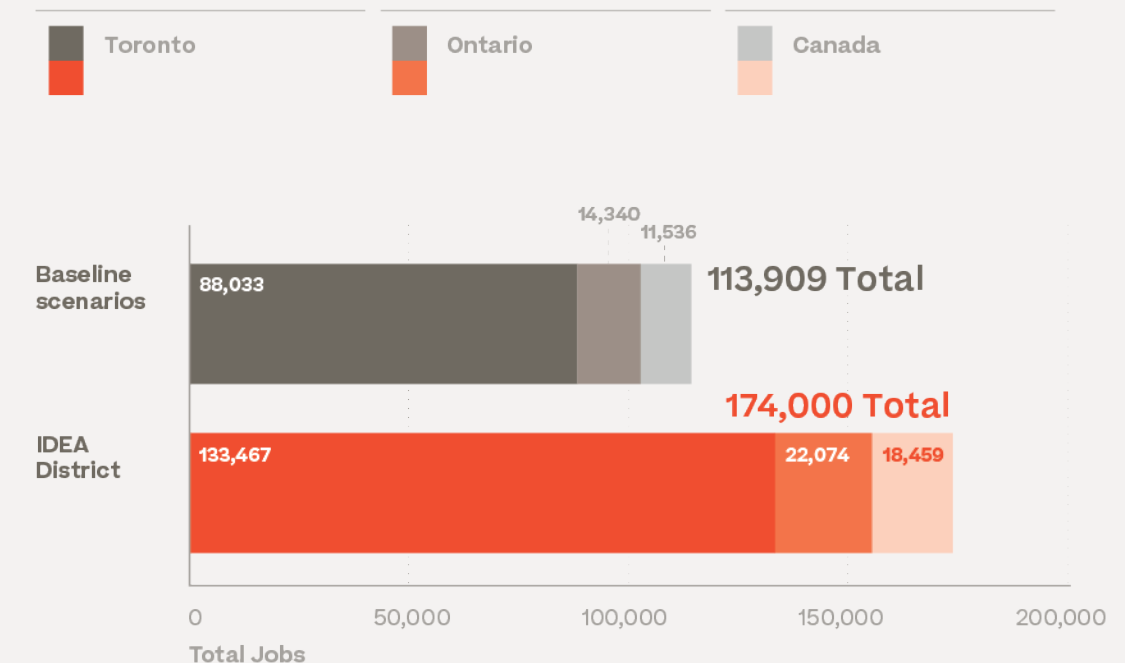
More than 50% increase in total construction taxes generated at completion

Under Sidewalk Labs' vision for the IDEA District, vertical and infrastructure construction projects would generate roughly \$8.6 billion in taxes by 2040, representing the full potential buildout of the IDEA District. This revenue would be spread across the federal (\$3.2 billion), provincial (\$3.1 billion), and local (\$2.3 billion) levels. In aggregate, this revenue amounts to a more than 50 percent increase in the amount that would be generated under the baseline scenario, according to the urbanMetrics analysis.



More than 50% increase in total construction jobs at completion

The construction of the IDEA district would create 174,000 person-years of full-time employment within Canada, 60,000 person-years of full-time employment more than the baseline scenario.



Note: All baseline scenario calculations are estimated to have a 2050 completion of construction, while all IDEA District calculations are estimated to have a 2040 completion of construction.

Exploring Economic Impact Further into the Future

Extending the innovation ecosystem beyond the IDEA District has the potential to create a total of 150,000 jobs, generate \$22.4 billion in ongoing economic output, and produce \$6.8 billion in tax revenues.

Advancing economic opportunities

The Sidewalk Toronto project proposal involves transforming 77 hectares of the eastern waterfront — less than one third of the total area — into an IDEA District that creates the conditions for urban innovation to thrive, helping to achieve Waterfront Toronto and City of Toronto objectives around affordable housing, economic opportunity, sustainable mobility, and climate positivity.

The business plan put forward in Volume 3 encompasses only the geography of the IDEA District, which includes Quayside and the River District. Over the long term, if the approach taken in the IDEA District proves successful in advancing and accelerating key public policy goals, it is possible to imagine extending this innovation ecosystem to neighbouring areas, bringing thousands of jobs as well as new public transit connections.

The area south of the Ship Channel is likely to become especially important for consideration of future development. The Port Lands Planning Framework identifies this area as a long-term revitalization opportunity.⁹⁵ It is unique in being surrounded by water on three sides and being home to the Hearn Generating Station, a vast decommissioned power plant and heritage structure that could anchor meaningful economic and community growth.

Sidewalk Labs’ proposal does not include any specific plans for nor any Sidewalk Labs role in the development of this area. But the approach taken by the IDEA District could enable Ports Toronto (which owns roughly 35 percent⁹⁶ of the land south of the Ship Channel), Waterfront Toronto, and the city to further advance economic opportunities and help achieve priority outcomes around climate-positive development, housing affordability, and sustainable mobility. It could also further complement a significant expansion of the Film District and support the ongoing consolidation of more traditional and large-scale industrial uses into the East Port.

The urbanMetrics analysis found that the development approach initiated in Quayside and the River District — emphasizing innovation, greater densities, and mixed-use development — could realize enormous economic potential south of the Ship Channel, if applied by third parties.

On its own, development south of the Ship Channel could become home to over 26,000 direct jobs, create \$8.1 billion in annual GDP, and generate \$2.5 billion in tax revenues.

South of the Ship Channel by the numbers:

- Over 26,000 direct jobs
- \$8.1 billion in annual GDP
- \$2.5 billion in annual tax revenue



Map
Potential South of the Ship Channel geography

- Eastern waterfront
- IDEA District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2
- South of Ship Channel (future option)
- Sidewalk Labs develops real estate and advanced systems

Combined with Quayside and the River District, this expanded innovation ecosystem could be home to over 70,000 direct jobs at the waterfront and support the creation of an additional 77,000 jobs throughout Canada (over 60,000 within Ontario). The economic benefits translate into \$22.4 billion in annual GDP — a 262 percent increase in value added to the Canadian economy compared to status quo development at completion — and \$6.8 billion in tax revenues.

In addition, the construction alone of the entire area could generate over 267,000 person-years of full-time employment, over \$34.7 billion in economic output, and over \$13.1 billion total in taxes throughout Canada.

Sidewalk Labs believes that if the development of the River District proceeds as proposed, it could accelerate development south of the Ship Channel, greatly compressing the time frame during which Canada would realize these benefits.

With public transit in place, newly connected neighbourhoods could become major economic drivers, especially the area surrounding the Hearn.

Further extending transit infrastructure to realize the waterfront’s full potential.

Just like in the IDEA District, the area south of the Ship Channel area lacks basic infrastructure and connections to the rest of the city, creating significant barriers to realizing potential economic and community benefits for the city.

The area’s extraordinary assets lend themselves to a rare mix of nature, jobs, and housing. As a result, in the long-term, an additional public transit extension could support economic growth as well as more integrated live-work-make communities.

The city’s approved light rail expansion plans have the line ending in Polson Quay and looping back to the rest of the city. This extension could continue across two new bridges built to carry transit across the Ship Channel. The new route could form a large “U” across the southern edge of the eastern waterfront that would connect to the city’s broader transit network, supporting sustainable development and jobs access.

With public transit in place, newly connected neighbourhoods could become major economic drivers, especially the area surrounding the Hearn.

Toronto case study

The Bloor Viaduct: A precedent for visionary infrastructure investments in Toronto



Toronto’s decision to construct the Bloor Viaduct in 1918 proved visionary, as it set the path for the subway system to connect the east end with downtown. Credit: City of Toronto Archives

Investing in a transit expansion south of the Ship Channel, as well as the bridges to support it, would echo the city’s ambition when it constructed the Bloor Viaduct in 1918.⁹⁷ At the time, there was significant controversy over including support for rail transit along the bottom of the viaduct, when the city had not even secured a rail operator.

This vision proved to be prescient, as the new infrastructure became the path for the Toronto subway, connecting the east end of Toronto with downtown. The expanded subway transformed

neighbourhoods all along the route, making it easy and affordable for thousands of people to reach jobs downtown and fostering new economic anchors all along the corridor.

This extension has become a shining example of the value created for people, jobs, and the environment when ambitious transit infrastructure is embedded into plans from the beginning.



The Hearn is a 400,000-square-foot megastructure that could become a prime site for driving economic development for the eastern waterfront. Credit: DroneBoy

The Hearn as economic catalyst

One of the most significant economic development opportunities involves the Hearn, a 400,000-square-foot megastructure that opened in 1951 as a coal-fired power plant and was decommissioned in 1983. This extraordinary space has been largely abandoned, but its towering smokestack, visible across the city, stands in silent testimony to the eastern waterfront’s history and the area’s future potential.⁹⁸

The Hearn sits at the middle of Unwin Avenue, right next to a potential light rail stop and bridge that could connect the area south of the Ship Channel up an extended Broadview Avenue through the Film District, McCleary, East Harbour, and Toronto’s revitalizing east end. This location, along with the structure’s unique

architecture, makes the Hearn a prime site for driving economic development for the region.

Recent years have seen glimpses of this potential. In 2002, Studios for America leased space at the Hearn and later bought the building. The iconic smokestack, towering ceilings, vast open space make it appealing as a potential film location, and the Hearn has hosted shoots, including for the Oscar-winning 2018 film, “The Shape of Water.”

The building has also hosted major cultural events, most notably in 2016, when the Luminato Festival used the Hearn for its festival hub.⁹⁹ Thousands of people flocked to the Port Lands — many for the first time — demonstrating the Hearn’s ability to draw crowds through innovative public programming and to become a



In 2016, the Luminato Festival drew thousands of people to the Hearn, demonstrating its ability to attract crowds through innovative public programming. Credit: PARTISANS

symbol for urban transformation, cultural expression, public accessibility, and civic celebration.

As Toronto continues to revitalize its eastern waterfront, the Hearn could become a centrepiece of this transformation and a city-wide magnet for arts, culture, production, and innovation. As it once powered the city with electricity, the Hearn can again be a generator — now of post-industrial forms of production, creating jobs and businesses while offering educational, cultural, and recreational resources that complement and catalyze Toronto’s existing strengths across a variety of industries.

It can support the future of the film industry by bringing together emerging new media businesses, training programs, production spaces, and film screenings. It can be an incubator of new creative

projects, businesses, and institutions through a shared infrastructure that facilitates cross-disciplinary collaborations. The Hearn can become a gathering space, marketplace, and everyday asset for recreation, culture, and learning that will draw local and visiting populations. And it can be a trailhead, adding environmental, recreational, and educational assets to the diverse ecology of the Port Lands, from Lake Ontario to the Don Valley.

In short, the Hearn can become a microcosm and driver of a rejuvenated Port Lands that is built on the principles of adaptability, innovation, and mixed-use development.

Building on global precedents of post-industrial revitalization. The approach to the Hearn as an economic catalyst could draw insight from many global examples of successful



The RDM Rotterdam campus is a six-hectare mixed-use campus on a former shipyard that has started to reactivate the area, including spawning 40 new companies. Credit: Vincent Wegener

revitalization of post-industrial sites. The most successful examples present a set of common characteristics: shared infrastructure, cross-disciplinary programming, resident and visiting populations, educational partnerships, and fabrication spaces. They also act as sparks in transitional districts, invigorating surrounding communities.

One of the most successful and innovative post-industrial catalysts of urban growth is the RDM Rotterdam campus in the Netherlands. (RDM stands for Research, Design, Manufacturing.)

While Rotterdam is still host to the largest port in Europe, a significant stretch of its waterfront had fallen into disuse as shipping activities migrated further downstream the Nieuwe Maas river. This relocation created roughly 1,600 hectares of underutilized land.¹⁰⁰

In 2007, Rotterdam Port Authority, Rotterdam University of Applied Science, and Albeda College collaborated to develop the RDM project, with an aim to educate talent and foster innovation for the future needs of a sustainable port and city. The result was a six-hectare mixed-use campus on a former shipyard that has started to reactivate the area, including spawning 40 new companies.

The campus centerpiece is the 230,000-square-foot Innovation Dock, a vast machine hall filled with prototyping equipment including robots, 3D metal printers, laser cutters, and an aquatic lab for hydrodynamic testing. Demand has been significant: 100 percent of this space is now leased out. The campus also boasts a “Concept Village” to demonstrate housing prototypes and a cultural platform for concerts, art exhibitions, and commercial events.

The Hearn has similar potential to become an anchor for urban innovation that draws the economic opportunities initiated in the IDEA District further into the eastern waterfront, supporting the area’s position as a global hub for this growing industry and spreading new ideas around the world.

Coupling economic development with ambitious quality-of-life objectives

As mentioned throughout this chapter, the unique economic opportunity of urban innovation is that it both is a growing, diverse industry that can support tens of thousands of jobs, as well as an industry built around tackling the major urban challenges facing cities today. To that end, in addition to catalyzing economic opportunity, the area south of the Ship Channel has the potential to further advance the waterfront’s priority outcomes of sustainability, housing affordability, and people-first mobility.

Should Waterfront Toronto and the city decide to extend advanced infrastructure systems beyond the IDEA District, these systems would allow for a further reduction of greenhouse gas emissions per capita beyond those achieved in Quay-side and the River District. Sidewalk Labs estimates that a reduction of 92 percent emissions beyond current city levels would be possible.

By expanding a holistic mobility approach south of the Ship Channel — including extensions to public transit, streets designed to encourage safe cycling and walking, pricing models designed to encourage shared trips, and coordinated traffic technology — Sidewalk Labs estimates that only 9.5 percent of trips would be made by private automobile by 2041. The result could be a sustainable model for other cities trying to plan for self-driving technology and the future of urban mobility.

Finally, if a housing vision with 40 percent below-market units were expanded south of the Ship Channel, it could create a cumulative 20,000 units of below-market housing (half affordable housing, half middle-income housing). While such a vision would require significant public-sector contributions, new sources of developer funding — such as greater land value created by factory-driven construction techniques or condo resale fees — could help support ambitious affordability objectives by generating almost \$2 billion through 2050 for below-market housing, at this scale of development.

Sustainability innovations could reduce GHG emissions by 92% if applied south of the Ship Channel

Mobility innovations could result in just 9.5% of trips occurring by private car if applied south of the Ship Channel

Affordability innovations could create some 20,000 units of below-market housing if applied south of the Ship Channel

Realizing the eastern waterfront's long-held potential

For more than a century, Toronto has tried to unlock the potential of the eastern waterfront as an outlet for inclusive growth. The innovative approach to development described in Volume 1 represents a belief that a powerful moment has arrived for the city to finally realize its long-held vision for this area.

This unique approach can not only meet but exceed Waterfront Toronto's ambitious priority outcomes. It can create new momentum for mixed-income, mixed-use, climate-positive communities along the waterfront. And it can create the conditions for a spirit of exploration to emerge — one that harkens back to the area's industrial past and draws innovators from around the world to a place designed from its core to help improve the lives of people in cities, both now and into the future.

Endnotes

General note: Unless otherwise noted, all calculations that refer to the full proposed IDEA District scale are inclusive of the entirety of its proposed geography, including all currently privately held parcels (such as Keating West). Unless otherwise noted, all currency figures are in Canadian dollars. Additional information can be found in the MIDP Technical Appendix documents, available at www.sidewalk-toronto.ca/midp-appendix.

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